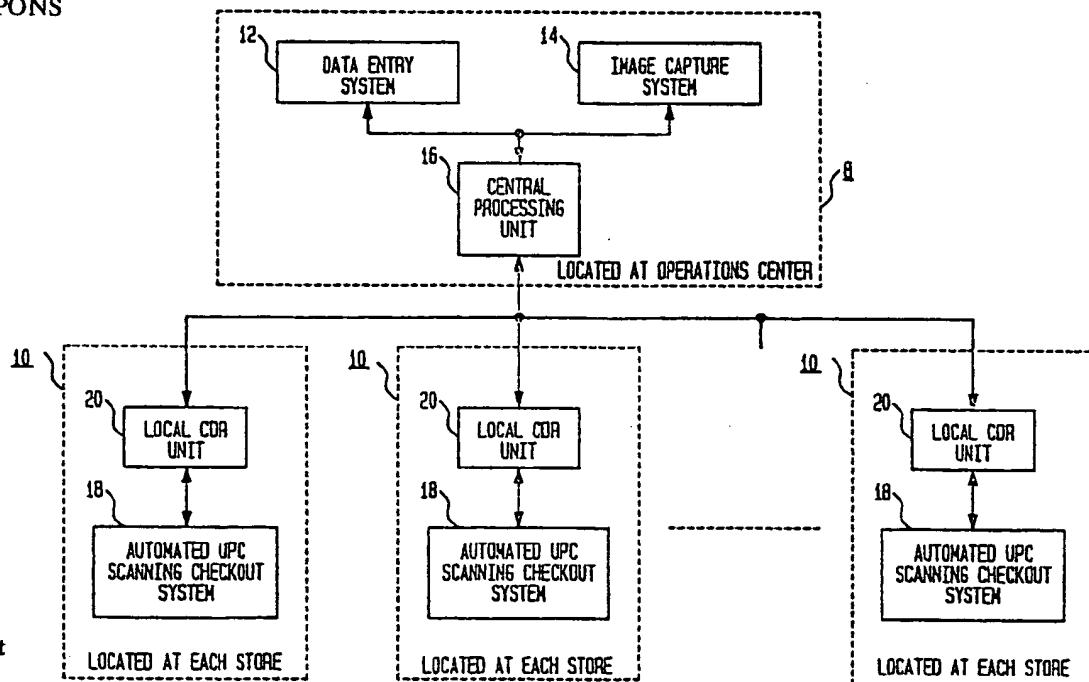


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**(54) Title:** PAPERLESS SYSTEM FOR DISTRIBUTING, REDEEMING AND CLEARING MERCHANDISE COUPONS

**(57) Abstract**

Cents-off merchandise coupons are distributed and redeemed immediately and electronically. An electronic display of coupons (20) valid for use in a particular store is presented to customers in that store. When a customer makes a selection of coupons (58) from the display, the selection is recorded (62). The customer is subsequently identified (72) at a store checkout station as the one who made the selection. In a preferred embodiment, the identification is made by scanning a special card adapted for use with the system. The items purchased in the store by the customer are recorded (74), any matches between the coupons selected and the items purchased are determined electronically (64). The customer is immediately credited (76) in accordance with the terms of the matched coupons. Redeemed coupons are periodically cleared electronically (80, 82).

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Paperless system for distributing, redeeming  
and clearing merchandise coupons.

This invention relates to the distribution,  
redemption and clearing of coupons and the like. More  
particularly, the invention relates to a highly-effective  
and efficient method and apparatus whereby coupons (such  
as cents-off merchandise coupons) can be distributed,  
redeemed and cleared electronically.

#### BACKGROUND OF THE INVENTION

Coupons are an important marketing tool for many  
consumer goods and services including, but not limited to,  
products sold in supermarkets, drugstores and hardware  
stores. "Couponing" constitutes a substantial business  
per se and makes an even greater contribution to gross  
national product by its stimulation of sales of promoted  
goods and services.

Most coupons offer "cents off" the purchase  
price of promoted merchandise. There are at present seven  
major conventional channels plus a few relatively new  
systems employing mechanized devices for the distribution  
of cents-off merchandise coupons.

The most widely used and fastest growing conven-  
tional channel is the Sunday newspaper free-standing  
insert (FSI), which accounted for 33% of all coupons  
distributed in the U.S. during 1983.

Although this means of distribution offers  
widespread exposure, many of the individuals exposed are

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1 not immediately in the market for the promoted merchandise,  
and the redemption rate typically runs a mere 4.6%, so  
that by far most of the coupons printed and distributed at  
considerable cost are effectively wasted. In addition,  
5 about 20% of the redemptions are not in accordance with  
the terms of the coupons. Such misredemptions or fraudulent  
redemptions may be accidental or intentional on the  
part of the customer and with or without the connivance of  
the retailer. In some cases the retailer or personnel  
10 employed by the retailer may clip coupons from a newspaper  
and "redeem" them for personal gain. The cost of misredemptions  
in the U.S. in 1983 was approximately \$350  
million. Finally, the retailer's cost of shipping and  
handling each coupon currently averages an estimated  
15 \$.078. This expense is in addition to the costs paid  
to and borne by other businesses involved in the distribution-  
redemption and clearing cycle. One such additional  
cost, which is borne by the coupon issuer, is for making  
test counts of coupons returned to the issuer by the  
20 clearinghouse. This cost amounts to about \$.02 per coupon  
redeemed and cleared.

This channel of distribution is characterized by  
the further problem that there is no control, other than  
the coupon expiration date, which is typically a fairly  
25 remote future date, over the timing of coupon redemptions.  
It sometimes happens that coupon redemptions exceed projections,  
resulting in excessive coupon expense. Once the  
coupons are issued, there is little that can be done to  
protect against this expense.

30 Another problem characteristic of this channel  
of distribution is lack of exclusivity. While a particular  
FSI may offer exclusivity (for example, soap coupons  
limited to one brand or one manufacturer's brands), other  
FSIs in the same newspaper may include competing coupons.

35 Still another problem of this channel of distribution  
is "double couponing", which is a practice of  
retailers of giving double (or some other multiple) of the

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1 face value of a coupon. The practice of double couponing  
is an effective marketing tool until all stores in an area  
double coupon. At that point the competitive advantage  
is lost and the practice becomes a problem for the retailer.  
5 Double couponing costs an estimated 0.66% of supermarket  
sales, which is clearly a serious matter in this industry,  
which reports profits of only about 0.85% of sales.

A second mass-media distribution channel for  
cents-off merchandise coupons is a single offer in a  
10 manufacturer's advertisement in a newspaper. This channel  
accounted for 23% of coupons distributed in 1983.

A third such channel is multiple newspaper  
offers in a co-op format, which accounted for 15% of  
coupons distributed in 1983.

15 A fourth such channel is magazine coupons (not  
including pop-out type), which accounted for 13% of  
coupons distributed in 1983.

A fifth such channel is newspaper coupons  
printed in the body of the paper, which accounted for 6%  
20 of coupons distributed in 1983.

The redemption rate for each of the second  
through fifth channels listed above is less than 4.6%, and  
the drawbacks of each (misredemptions, expense, lack of  
control, lack of exclusivity, double couponing, etc.) are  
25 as substantial as those described above in connection with  
the Sunday newspaper free-standing insert.

Another conventional channel of coupon distribu-  
tion is direct mail, which accounted for 3.8% of coupons  
distributed in 1983. The redemption rate for this channel  
30 is 9.3%, which is higher than the rates for any of the  
channels discussed previously, but, as compared to those  
channels, the cost of redemption and exposure to fraud are  
as great, the distribution cost is far greater, and the  
other drawbacks are comparable.

35 In-package and on-package coupons accounted for  
6.2% of all coupons distributed in the U.S. during 1983.  
The redemption rate ranges from 12.7% to 18.1%, depending  
on the location of the coupon. This is higher than for

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1 direct mail, but the shortcomings (misredemptions, expense, etc.) are similar to those described above.

Recently, in-store coupon distribution systems employing mechanical devices have been developed. In  
5 these systems, a plastic card (such as a credit or debit card) with a magnetic stripe or UPC code is required to initiate the coupon selection process. The selected coupons are physically issued to the customer in-store and redeemed by the customer at a checkout station after  
10 completion of shopping. While the coupon redemption rates for these systems are far higher than for any previous system, misredemptions and the cost of redemptions, clearing and test counting are problems which the conventional mechanized distribution systems do not solve.

15 Moreover, the current system of clearing coupons which are distributed and redeemed in accordance with any of the methods described above involves physically sending redeemed coupons to a clearing house. The clearing house returns the coupons to the manufacturer (issuer) and issues  
20 debits and credits to the manufacturer and retailer, or factors coupons for the retailer. This physical handling of coupons is expensive, cumbersome, error prone and slow.

#### OBJECTS OF THE INVENTION

25 An object of the invention is to alleviate the problems of conventional coupon distribution, redemption and clearing systems outlined above and, in particular, to provide such a system whereby redemption rates are increased, the cost of coupon distribution, redemption and clearing is reduced, and fraudulent redemptions of the type  
30 that are characteristic of conventional coupon distribution and redemption systems are eliminated.

Other objects of the invention are to provide a system which (a) enables close control over the number and timing of coupon redemptions, (b) makes it possible for a  
35 coupon issuer to obtain exclusivity for the issuer's coupons, and (c) eliminates the problem of double couponing.

Still other objects of the invention include, but are not limited to, the following:

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1 to provide a system in which a customer  
selects coupons at home or upon entering a particular  
store and redeems the coupons upon completion of shopping  
in that store or later, but within the period of validity  
5 of the coupon;

to provide a system wherein coupon selec-  
tions by a customer who has properly identified himself  
are recorded electronically, are later matched electroni-  
cally with the customer's purchases, and are electroni-  
10 cally credited against the customer's bill and entered in  
the store's accounting system and in a central system that  
advises and bills the manufacturer;

to provide a coupon distribution and  
redemption system which is compatible with, or integrated  
15 into, an electronic cash register system or an automated  
checkout (UPC code scanning) system;

to provide a coupon distribution and  
redemption system which can identify users of the system  
before they make coupon selections and offer different  
20 coupons to different users of the system on the basis of  
already-obtained demographic data about the users.

A coupon distribution and redemption system  
according to the invention is characterized by increased  
impulse sales to new product users, and increased retailer  
25 willingness to aggressively merchandise products promoted  
by the system, since use of the system by the retailer is  
a source of profit in addition to the profit made on the  
sales of the merchandise; complete control of coupon  
distribution and substantial control of coupon redemption,  
30 including control of the quantity of coupons distributed  
per period of time and per location, and control of the  
time period, quantity and location of redemption; con-  
trolled market-by-market consumer awareness programs,  
including FSI advertising of coupons offered; avoidance  
35 of stockouts on heavily promoted items; and avoidance of  
the need to change the prices on promoted products.

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1     SUMMARY OF THE INVENTION

          The foregoing and other objects are achieved in accordance with the invention by providing apparatus for distributing and redeeming coupons and the like. The  
5     apparatus comprises display, selection and recording means for presenting to a customer a display of coupons, for enabling the customer to make a selection of coupons from the display, and for recording the selection.

          Identification and checkout means is provided  
10    for identifying the customer at a store checkout station as the one who made the selection and for recording items purchased in the store by the customer.

          Matching and crediting means is provided for determining any matches between the coupons selected and  
15    the items purchased and for crediting the customer in accordance with the terms of the matched coupons.

          A central processing unit responsive to the matches debits the coupon issuing entity and credits the store with respect to the matched coupons.

20    BRIEF DESCRIPTION OF THE DRAWINGS

          Fig. 1 is a block diagram of the overall system according to the invention;

          Fig. 2 is a flowchart showing the protocol in accordance with which special cards preferably used in  
25    accordance with the invention in lieu of selected magnetic stripe cards are issued;

          Fig. 3 is a flowchart showing coupon and advertisement image capture and distribution in accordance with the invention;

30    Fig. 4 is a flowchart illustrating coupon selection and redemption in accordance with the invention;

          Fig. 5 is a block diagram of a local coupon distribution and redemption (CDR) unit constructed in accordance with the invention;

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1 Fig. 6 is a key to the symbols employed in  
Figs. 7-40; and

Figs. 7-40 comprise a flowchart showing the  
operation of the CDR unit of Figs. 1 and 5.

5 DETAILED DESCRIPTION

A. Summary of System Operation

For the purpose of description, the invention  
is described in connection with the selection (distribu-  
tion) and redemption of coupons in a store such as a  
10 supermarket where, currently, cents-off merchandise  
coupons are commonly used. As explained in a subsequent  
section of the specification, other arrangements for  
selecting/distributing coupons are also contemplated by  
the invention.

15 Fig. 1 represents a system in accordance with  
the invention. An operations center, shown at 8, cooper-  
ates with with a plurality of local stations 10. Each of  
these local stations 10 will be located at a supermarket  
(in this example) where the coupons are to be distributed  
and redeemed. The operations center 8 typically will be  
20 centrally located with a view toward ease of communication  
between it and each of the local stations 10. For conveni-  
ence, only a single operations center 8 is illustrated  
although the functions of the operations center may be  
25 broken up into any desired number of individual centers.

The operations center 8 contains a data entry  
system 12, an image capture system 14 and a central  
processing unit 16. The specific functions of each of  
these units is described below. Generally, the data entry  
30 system is used to establish the data base which enables  
card issuance and the generation (if desired) of various  
reports on such subjects as, for example, demographic  
information relating to the individuals who have redeemed  
the coupons.

35 The image capture system 14 essentially is  
responsible for enabling video images of the coupons to be  
presented at the separate stores. The central processing

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1 unit (CPU) 16 has a wide range of functions, generally  
handling the clearing process controls information flow to  
the local units and in the operations center itself.

Each of the local stations 10 may be considered  
5 to consist of an automated UPC scanning checkout system 18  
and a local coupon distribution and redemption (CDR) unit  
20. The local CDR unit 20 presents an electronic display  
to the customer of the coupons which are available for  
redemption after the customer inserts a card as described  
10 below into the unit. The card may include a UPC code  
which identifies the user and a magnetic stripe on which  
information can be recorded. The customer then selects  
the coupons which he or she wishes to redeem. The CDR  
unit 20 records the selection and makes information  
15 identifying the customer and the selected coupons available  
to each of the checkout stations which comprise the  
checkout system 18 of the supermarket. A receipt may be  
printed for the user's convenience, identifying the  
selected coupons.

20 After the user has made his or her purchases, he  
or she goes to one of the checkout stations and presents  
his or her card to the attendant at the station. The  
attendant causes the card to be read by a suitable card  
reader (such as a UPC card scanner) and the checkout system  
25 18 then automatically credits the customer for the coupons  
the customer has selected where there are corresponding  
purchases against which the coupons are to be applied.

Thereafter, information regarding the redeemed  
coupons is transmitted to the central processing unit 16  
30 which then automatically debits the manufacturer who dis-  
tributed the coupons and credits the supermarket corres-  
ponding to the local station 10 at which the coupon was  
redeemed.

Hence, in the preferred embodiment, selection  
35 (distribution), redemption and clearing are accomplished  
automatically without handling of paper coupons by custo-  
mer or store and thus without the possibility of the types  
of fraud which now plague the industry.

1 In the following portion of the specification,  
the operations of the individual blocks shown in Fig. 1  
are described in detail. There are numerous modifications  
and embellishments of the preferred embodiment which are  
5 possible within the scope of the invention. Some of these  
are described at the end of the specification in the  
section entitled "Modifications and Embellishments."


B. Special Card Issuance Summary

Fig. 2 is a flowchart summarizing the procedure  
10 employed to issue a special card for use with the invention.  
Preferably, the card will identify the customer (e.g. by  
UPC code) and include magnetic tracks identifying the cus-  
tomer and on which data can be recorded as described below.  
As used herein, the term "special card" refers to such a  
15 card with the customer identifiable by both UPC and magnetic  
stripe readers, as opposed to a standard credit card (for  
example) which today contains a magnetic stripe but general-  
ly does not include an UPC code to identify the customer.

Completed requests for applications for a special  
20 card represented at 22 are received by mail and from parti-  
cipating merchants. The requests forwarded by merchants  
may be filled in on the receipts discussed above. They  
contain the customer's name, address and telephone number  
and are key-entered as indicated at 24 into the data entry  
25 system 12 (Fig. 1). Edit checks verify that all required  
information is received. A temporary customer number is  
also assigned. This data is then passed to the central  
processing unit 16.

The central processor 16 edits the incoming file  
30 and compares each record against the customer master file  
for potential duplications. For each valid new request,  
an application 26 is generated and mailed to the customer  
and the "temporary" customer record is added to the  
customer temporary master file 28.

35 When completed applications containing the  
demographic data are returned by the customer, they are  
read by a mark-sense reader 30 using the previously  
assigned temporary customer number to eliminate re-entry  
of the customer's name, address and telephone number.



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1 This data is then passed to the central processing unit 16.  
The central processor 16 edits the incoming file and flags  
the corresponding temporary records in the customer master  
file, as indicated at 32, to indicate that the applications  
5 have been received. The temporary master file is updated  
with the demographic data and special card issuance orders  
are sent by magnetic tape, as indicated at 34, to the card  
issuing agent 36.

Subsequently, the CPU 16 receives back a tape  
10 from the card issuing agent 36 indicating which pre-  
numbered card was actually assigned and mailed to that  
customer, as indicated at 38. At that time, the record is  
permanently activated on the master file under the card  
number assigned, as indicated at 40.

15 C. Image Capture and Distribution Summary

Fig. 3 is a flowchart showing the operation of  
the image capture system 14. Camera-ready art work for  
the coupon displays (and advertising screens) is prepared  
in the same manner as that used for other common forms of  
20 advertising. A digitized image of the art work is recorded  
electronically, as indicated at 42. Associated parameters  
such as the number of coupons to be distributed are entered  
via a terminal device and the graphic data is then compacted,  
as indicated at 44. The compacted data and associated para-  
25 meters are passed to the central processing unit 16.

In the central processor 16, the compacted image  
data is blocked to facilitate its transmission to the local  
CDR units 20 specified in the parameters. The central pro-  
cessor 16 then transmits the new advertisement and coupon  
30 images as necessary, as indicated at 48. CDR unit disk  
file status 50 is transmitted to the central processor 16  
periodically, and this information goes to status files  
52. Generally, portions of this data are sent nightly  
over dial-up telephone circuits or other communication  
35 means so that a complete new set of coupon and advertising  
displays is available to the local CDR units each period.  
Much of the data is identical for each "region" usually  
so that the operations center has positive confirmation as

1 to which transmissions have been properly received and  
filed by each CDR unit 20 consisting of between fifty and  
five hundred terminals. However, provision can also be  
made for entry of data locally into the CDR's when and  
5 where such is advantageous. At 1200 baud, the data  
loading takes approximately 12 hours each week, although  
this time can vary based on image quality, number or  
images and practical limitations on data compression.  
Using 2400 baud reduces the update time correspondingly.  
10 Either rate is fast enough to enable updating of the  
system during late night hours, which is especially  
advantageous if it is otherwise impossible to complete the  
update without interrupting use of the unit 20. Compacting  
the data also reduces update time.

15 C. The Data Entry System

The data entry system 12 (Fig. 1) utilizes  
standard key-to-disk hardware. The system may comprise a  
minicomputer with appropriate amounts of memory and disk  
space for the number of terminals required. While a  
20 communications link with the central processor 16 is a  
general requirement, an optional tape drive may be neces-  
sary under certain unusual conditions. Likewise, printing  
support for the data entry function (operator productivity  
reports, etc.) will generally be provided by the central  
25 processor 16.

Mark sense readers, similar to those used to  
grade multiple choice examinations, are preferably used to  
capture data from most of the completed applications for  
special cards.

30 Data entry software includes programs and  
utilities to create batch header records, format screens,  
perform basic editing functions and monitor operator  
productivity. The software also facilitates specialized  
edit functions, assignment of temporary customer numbers,  
35 etc.

The data entry system 12 supports the various  
data capture functions associated with creating and  
maintaining a data base of special card customers. As

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1 such, it is used primarily to process customer input such  
as application requests, applications, address changes,  
special card re-issuance requests, etc.

5 Requests for applications are received by mail  
and from participating merchants. They indicate the  
customer name, address and telephone number, which must be  
key entered. In addition, completed applications may be  
key-entered by some customers directly into the local CDR  
unit 20.

10 A header record must also be produced for each  
batch of application requests, indicating constant informa-  
tion such as:

date  
batch number  
15 type of work  
operator identification and, if applicable,  
merchant identification.

The data entry system must preferably edits the  
data and assign a unique temporary customer number to each  
20 request for application entered into the system. The file  
is then passed to the central processor 16 (Fig. 1).

Completed applications contain the following  
information in machine readable form: temporary customer  
number (assigned previously), confirmation that the  
25 printed name, address and phone number are correct, and  
demographic data.

Corrections to name, etc., must be key entered.

A header record should also be produced for each  
batch of applications, indicating information such as date,  
30 batch number, type of work and operator identification.

The data entry system 12 preferably edits the  
data and passes it on to the central processing unit 16.

Other miscellaneous communications requiring  
data entry support to update the master file include:

35 Change of address notices  
Lost, stolen or mutilated card reports

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1 Returned mail cancelations (card undeliver-  
able)

Replies to requests for supplemental  
information.

5 Header records similar to those above will also  
normally be required for these transaction types to mini-  
mize key entry of constant data.

D. Image Capture System

10 The image capture system 14 is microprocessor-  
based although best driven systems may also be used. The  
basic components include the microprocessor with appropri-  
ate disk capacity, a color camera capable of capturing a  
color image and a color terminal display to control its  
operation and display results. The device may attach  
15 locally to the central processing unit 16 to facilitate  
the substantial communications requirements involved.

The software provides the basic capabilities of  
the system and associates parameter data such as screen  
number and location on the screen entered via the terminal  
20 with the corresponding image record.

Finished art work for both coupons and advertis-  
ing displays is captured in digital form. The system then  
performs the following tasks:

25 Perform run length encoding or other suit-  
able compaction

Accept and associate parameters for text  
overlays

Accept and associate parameters for coupon  
usage

30 Accept and associate parameters for ad usage  
Display results of image digitization for  
evaluation

Pass data to the central processor 16.

E. Central Processing Unit

35 An IBM 4300 series unit is suitable for use as  
the central processing unit 16. Depending upon the number  
of customer records and local CDR units 20 supported, the

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1 CPU 16 generally requires about two megabytes of RAM  
memory, approximately 500 megabytes of disk storage, a  
tape drive and a printer. Various communications devices  
and modems are also required.

5 A number of intermediate systems may be provided  
if desired to assist in the task of communicating with a  
multiplicity of CDR units 20.

The central processor 16 utilizes standard com-  
munications, data base and statistical analysis software  
10 to the maximum extent possible.

The central processor 16 performs a variety  
of processing, control and communications functions  
including:

Application requests: On a daily basis, the CPU 16  
15 receives a handoff from the data entry system 12 contain-  
ing new requests for applications and their associated  
header records. The system then performs the following  
tasks:

Append necessary header data to each record  
20 Print edit failures  
Print input summaries/controls  
Print operator productivity reports  
Search for and flag records already on the master file  
List flagged requests for application  
25 Add others to master file under temporary number  
Print applications/mailers  
Print report of merchant submissions  
Credit merchant's "account" for submissions if  
retailers are to be paid a fee for collecting  
30 and submitting applications.

Delete temporary master records if application not  
received in 90 days. Applications: On a daily basis, a  
handoff will be received from the data entry system  
containing new applications and their associated header  
35 records. The system then performs the following tasks:

Append necessary header data to each record  
Print edit failures  
Print input summaries/controls



- 1       Print operator productivity reports
- Search for corresponding temporary records
- List applications not matched
- Add application date and demographic data to others
- 5       Write card issuance orders
- Create daily tape for card issuance agent
- Print follow-up report if card not issued in 5 days.

      In a similar manner, other types of input are received from the data entry system 12. Each must be  
10      processed in an appropriate manner. The following tasks are required:

- Append necessary header data to each record
- Print edit failures
- Print input summaries/controls
- 15      Print operator productivity reports
- Search for corresponding records
- List input not matched
- Update other records as necessary.

      Periodically, new images (graphic representations  
20      of the product) in digitized form are received from the image capture system along with the following parameters for each:

- Product name
- Short product description (coupons only)
- 25      Long product description (ads only)
- Prize description (special coupons only)
- Savings amount (coupons only)
- Expiration date (coupons only)
- CDR units 20 designated to receive data (individually  
30      or by region)
- Start and end dates for use
- Screen number
- Position on screen (coupons only)
- Coupon identification number (coupons only)
- 35      Advertisement identification number (ads only)
- Number of coupons to be issued (coupons only)

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1            Optionally, the entire coupon screen may be  
digitized as a single unit. Preferably, coupons are  
digitized individually. As the terminal base grows,  
5            further reductions in communications requirements can be  
achieved by creating standard, graphic formats for coupons  
which will be maintained by each CDR unit 20. At that  
point, only the unique portions of each coupon will  
require digitization and transmission.

            Special software to control the random distribu-  
10          tion of special coupons is provided. For promotional  
reasons, their redemption may be handled manually.

            The central processor 16 performs the following  
tasks associated with passing this data to the CDR units  
20:

15          Retain usage parameters  
            Verify usage parameters are not conflicting or  
                 incomplete  
            Divide data into blocks to allow partial transmis-  
                 sions  
20          Broadcast blocks of data to CDR units 20  
            Poll CDR units 20 for blocks received  
            Retransmit as necessary  
            Retain transmission status for each CDR unit 20  
            React to changes in status reported by maintenance  
25                  personnel

            Preferably, the system similarly updates the  
software in each terminal. Optionally, pre-initialized  
disks may be used for installations and replacements.

            Periodically, the central processor 16 calls  
30          each CDR unit 20 to collect redemption data for processing.  
This data includes:

            Special card number and transaction number  
            Redeemed coupons

            Optionally, the central processor 16 also  
35          collects data on other products purchased (without coupons)  
for selected customers. Such data could include product  
code, quantity, price, etc.

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1           In addition, header information will also be  
received which includes:

Business day

Identification of CDR unit 20

5           Special coupons issued

Summary of coupons issued and redeemed

Paper low and internal test sequence results

Current disk data and program status

10           Preferably, this data also includes utilization  
and additional maintenance status information.

Tasks relating to the collection of processing  
data include the following:

Poll each CDR unit 20 for redemption data

Maintain redemption data status (all days received)

15           Edit incoming data (including modulus check)

Print edit failures

Append necessary header data to each record

Add coupon values based on parameter table

20           Add merchant identification based on local CDR unit  
20 identification

Add manufacturer identification based on parameters

Debit manufacturer's "account" for redemptions

Credit merchant's "account" for redemptions

Output details for manufacturers and retailers

25           Print activity and control reports

Maintain status of special coupon distribution

Maintain balances of merchant and manufacturer  
"accounts"

Store transaction data for future investigation

30           Store historical data on parameters, accounts, etc.

Preferably, processing tasks also include:

Search for corresponding master record if special  
card was used

Print match failures

35           Update master record for others where appropriate

Periodically retrieve data on active accounts

Perform analytical routines

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1           Produce corresponding output for manufacturers  
Periodically purge master of old transaction data  
Periodically purge master of inactive accounts  
Print purge reports.

5           Many reports may be produced on a COM (computer  
output microfilm) tape for delivery to a microfiche  
vendor.

          The central processor 16 also supports a number  
of miscellaneous functions, primarily by providing various  
10 types of inquiry and update capability via terminal  
devices.

F. Coupon Distribution and Redemption Summary

          Fig. 4 is a flowchart illustrating coupon  
selection (distribution) and redemption. Customers using  
15 a CDR unit 20 are initially presented with advertisements,  
in a repeating sequence indicated at 54. The maximum  
length of an ad or similar filler display is preferably  
about 20 seconds. In order to ensure that the ads, etc.,  
are shown even when the unit 20 is constantly in use by  
20 consumers accessing coupons, the next sequential ad or  
filler display is preferably shown periodically, such as  
after every fifth user. In this case, the user sees a  
footnote in the display advising that the unit 20 will be  
ready to accept a card in a few seconds. Normally, the ad  
25 program runs until a card is inserted into the magnetic  
card reader.

          When a special card (as opposed to other magnetic  
stripe cards which may be allowed to actuate CDR unit 20  
for a limited period of time after installation) is proper-  
30 ly inserted into the card reader, a fifteen digit number  
and two digit security code on the card is read from a  
selected track of the card. Immediately after recognizing  
the card as a special card, the reader checks an area on  
the card designated for indicating when the user previously  
35 accessed coupons in that type of retail outlet.

          Thereafter, there are several possibilities. In  
one embodiment, if the notation indicates that the user  
accessed the system in that type of retail outlet during

1 that week (or other predetermined time period), a single  
screen appears explaining the reason that the card is not  
valid in that type of store for the remainder of the week  
(or other time period).

5 If the user's last access to the coupons in that  
type of retail outlet was not during the most recent week,  
the customer may proceed to select coupons.

Each coupon screen is filled with between one  
and twenty-four coupons. The user has preferably about  
10 fifteen seconds to choose coupons, or to touch the "hold"  
or the "next" space, before the next screen filled with  
coupons is displayed. If the "hold" space is touched,  
the user has preferably a total of about thirty seconds to  
choose a coupon from that screen. If the "next" space is  
15 touched, the next screen filled with coupons is immediately  
shown. If a coupon is chosen, that choice is noted under  
the user account number, and under a counter that counts  
the number of each coupon distributed. If the counter  
determines that the limit number of a particular coupon  
20 has been reached, that coupon is automatically removed  
from the system and is not thereafter displayed (unless,  
of course, appropriate new instructions for such display  
are received from the CPU 16). The user is then presented  
with the next screen filled with coupons. The process is  
25 identical for each screen.

After the last screen is seen, and a user  
decision made, the "account choice" record is created, and  
a receipt or shopping list may be printed. The receipt  
includes a receipt number, the product name and size, and  
30 the savings amount. It is used as a reminder to shoppers  
and can be used to identify the users of cards which are  
not special cards at checkout time. If a special card is  
used, a notation to that effect, including the period of  
such use, is magnetically recorded on the card, as indi-  
35 cated at 60. The customer's coupon selections are entered  
in a file, as indicated at 62.

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1           Coupon selection information is reported via a  
communications link to the local processor which controls  
the store's automated checkout (UPC code scanning) system,  
as indicated at 64. This facilitates a subsequent compari-  
5       son of coupons selected to purchases made.

          During the introductory period, customers  
without a special card will instead be allowed to utilize  
selected cards having a magnetic stripe to activate the  
CDR unit 20. In this case, the number printed on the  
10       receipt or coupon selection reminder can have operational  
significance if the receipt does not bear the account  
number and if the card does not display the account number  
in UPC code format. The customer shops as indicated at  
68, and proceeds to the checkout station, as indicated at  
15       70. Since the reminder bears the number under which the  
customer's selections are filed by the CDR unit 20, it is  
presented at checkout time in lieu of the special card.

          The functional objectives of the CDR unit 20  
can be achieved through various hardware and software  
20       configurations. As one example, the CDR unit 20 may  
comprise a five foot high metal enclosure, on the front  
panel of which are mounted a color video monitor 88 (Fig.  
5) with a touch screen sensor 90, a magnetic stripe card  
reader 92 and a coupon selection list printer 94, all  
25       within easy reach of a standing adult. The enclosure may  
also contain a speech synthesizer 96. The components of  
the CDR unit 20 interrelate to perform the various func-  
tions required of the terminal under control of a micro-  
processor 102 (Fig. 5). Programs and data files (including  
30       screen images) are stored on a Winchester disk 98. A  
modem 100 is used to communicate with the central process-  
ing unit 16 and a communication link 104 transfers trans-  
action data between CDR unit 20 and the local checkout  
system controller. Speech synthesis may be used to  
35       enhance the appeal of CDR unit 20 and to provide guidance  
through the selection process.

1           When a card is inserted into card reader 92,  
the device reads the customer number and expiration date  
encoded on one of the magnetic tracks on the card in ABA  
format. A security code may but need not be included. It  
5   also reads a transaction date or time period code which  
was encoded on the other track in IATA format during the  
previous transaction, possibly along with other details of  
prior transactions, or other data. When the customer's  
identity and usage period have been validated, he is  
10   presented with a screen of coupon choices from which to  
make a selection. When he has completed the selection, a  
new date or time period code is encoded on the card,  
possibly along with other data, and the card is returned  
to the customer. The card reader 92 interfaces with the  
15   microprocessor 102 via any number of means including a  
serial data path with a number of status and control lines.

          The preferred characteristics for the magnetic  
stripe card reader 92 are reliability of operation and  
ease of use by untrained operators. One such suitable  
20   reader is model MTM-290-3A available from SRD Corporation,  
Chiyoda-Ku, Tokyo, Japan. The specifications include

          Reads and encodes all three ISO standard  
          tracks

          Encoding Density:

25           Track 1:       201 BPI

          Track 2:       75 BPI

          Track 3:       210 BPI

          Card Speed: 430 mm/sec

          Card feed time: approx. 1 second for 1 round

30           Life: 500,000 passes

          Power: 5V, 12V

          Size: 8.4" x 3.5" x 2.6"

          Weight: 1.8 lb..

          The color video monitor 88 is used for three  
35   distinct purposes. It is used to give the customer  
instructions on the use of the terminal 20 and the status  
of his card, to present an advertising campaign, and to  
present screens of coupons for the customer's selection.

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1           The important characteristics of the color  
video monitor 88 are size, spatial resolution, color  
resolution and freedom from flicker. One such suitable  
monitor is model Color 710 of Amdek. The specifications  
5 include the following:

                  size:     12" diagonal  
                  RGB analog input  
                  .31 mm dot pitch  
                  720 (H) x 480 (V) resolution  
10               15.75 kHz horizontal scan  
                  Etched (non-glare) CRT  
                  Long persistence phosphor

                  The color video display graphics generator 106  
is used to convert a data file from the disk into the  
15 appropriate red, green, blue (RGB) analog signals and to  
generate synchronization signals for the color monitor 88.  
It may also be used to overlay the graphic images with  
text.

                  The important characteristics of the color  
20 graphics generator 106 are the spatial resolution, color  
resolution, color selection and speed of displaying an  
image from a disk file. One such suitable generator is  
model Cono-Color 40, available from Conographic Corpora-  
tion, Irving, California. The specifications include:

25               Spatial resolution: 640 x 400 pixels  
                  Color resolution: 16 out of 256  
                  Color construction: 3 red, 3 green, 2 blue  
                                bits/gun  
                  Display memory: 128 k bytes  
                  Field rate: 60 Hz minimum  
30               Refresh rate:  
                                Interlace: 2 field cycles  
                                Non-interlace: 1 field cycle  
                  Outputs: Analog RGB, IRGB, optional NTSC  
35               video  
                  IBM PC compatible interface



1 Includes CIOS and CURVE software (with text  
insertion)

Alphanumeric formats:

40 x 36  
5 80 x 36  
64 x 51  
40 x 25  
80 x 25

10 The touch screen sensor 90 is used by the  
customer to indicate his coupon selections and to control  
the screen advance. The customer selects one or more  
coupons per screen or indicates "no selection." At that  
point the next coupon screen is presented. If selection  
response is not received within a prescribed number of  
15 seconds and hold instruction is not touched by the customer,  
the next screen is automatically presented and no selection  
is recorded.

The important characteristics for the touch screen  
90 are reliability, ruggedness and compatibility with a  
20 safety shield. One such suitable scanner is available from  
Electro Mechanical Systems, Inc., Champaign, Illinois.  
The specifications include:

32 x 40 resolution  
Controller on one of four frame boards  
25 Infrared light emitting diode (LED) tech-  
nology  
Light and noise reduction circuit

The speech synthesizer 96 may be used to enhance  
the customer appeal of the CDR terminal 20 by providing  
30 friendly assistance and prompts to the customer. It may  
also be used to attract attention to the advertising when  
the terminal 20 is not actively being used by a customer.

The speech synthesizer 96 accepts ASCII text or  
phoneme codes and is capable of operating from a dictionary.  
35 One such suitable synthesizer is the Echo Speech Board,  
available from Street Electronics Corporation, Carpinteria,  
California. The specifications include:

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1 Programs contained in on-board ROM  
Serial RS-232 operation  
Uses Texas Instruments TMS 5220 speech pro-  
cessor  
5 2K RAM  
Accepts ASCII text, phoneme codes or message  
number inputs  
Size: 3-5/8" x 4-7/8" x 1"  
On-board power supply circuitry  
10 Contains 500 mW audio amplifier

When the customer has completed the selection of one or more coupons from each of the available coupon screens, a list of his selections is printed by the printer 94 and dropped into a coupon selection list  
15 dispensing tray so that he will be reminded of the savings he can realize on the selected items as he shops. He is assigned a receipt number which is printed on the coupon selection list. That receipt number allows the system to match up the customer's selections with his purchases to  
20 effect a redemption at checkout time in lieu of the special card. The printer uses a 3.25" wide continuous folded form. The paper supply normally lasts more than two weeks, and a sensor signals when paper is low. The paper-low signal is recognized by the microprocessor 102  
25 and forwarded to the central processing unit 16 as part of the terminal status report. The paper-low and other terminal status indications may also be displayed for service personnel.

The important characteristics of the printer 94  
30 are reliability; infrequency of service; absence of need for operator interaction or knowledge; high speed and the ability to print graphics. It is desirable to incorporate a paper cutoff mechanism, long continuous-feed paper supply, and an optical form sensor. One such suitable  
35 printer is model 2285 with knife and driver/option board, available from NCR Corporation, Ithaca, New York. The specifications include:

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1                   Printing method: dot matrix impact  
                   Print speed: 200 lines/minute  
                   Line feed: .030 seconds  
                   Columns: 40  
 5                   Paper width: 3.25"  
                   Paper thickness: .0027" - .0042" (.014" max.  
   total)  
                   Fonts: 7 x 7, 7 x 9 and graphics  
                   Line height: 5.6 or 7.5 lines/inch  
 10                  Form feed: 5 inches/second (line feed)  
                   Print head: 7-wire, clapper  
                   Print wire: 0.015" diameter  
                   Physical: 5.4" x 6.5" x 5", 4.1 lbs.  
                   Ink Ribbon: 50 ft. Nylon cassette, 10  
 15                                   million character life.  
                   Print head life: 150 million characters  
                   MCBF(C): 15 million print lines  
                   Operating temp: 0-50° C (32-120° F)  
                   Humidity: 5-90% relative humidity

20                  The Winchester disk drive 98 is used as the  
                   storage device for program and data files. Screen images  
                   occupy a significant portion of the data files. Each time  
                   a new screen is required, it is read from the disk 98 into  
                   semiconductor memory where it can be converted by the  
 25                  graphics controller into the screen image. Transaction  
                   data is also stored on the disk 98 for later transmission  
                   to the central processing unit 16. The disk drive 98 is  
                   environmentally sealed to prevent contamination which  
                   might affect reliability.

30                  The important characteristics of the Winchester  
                   disk drive 98 are reliability and capacity. One such  
                   suitable drive is model RO 203, available from Media  
                   Distributing, Scotts Valley, California. The specifica-  
                   tions include:

35                               Capacity: 20 MB unformatted, 15.75 MB for-  
   matted  
                   Transfer rate: 5 m bits/s

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Seek times: 90 ms average, 210 ms max.

Average latency: 8.3 ms

Flux reversals per inch: 8720, max.

Tracks per inch: 360

Rotational speed: 3600 RPM

Power required:

5V at 0.7 A

12V at 2A typical (4A motor start)

Dimensions: 8.00" x 5.75" x 3.25"

Shock:

Operating: 3g pk. less than 10 ms., max  
2/sec

Non-operating (with transit lock): 20g pk

Interface: ST506

Built in test (BIT): Performed by on-board  
microprocessor

Seek errors: less than 1 in each 5 million  
seeks

MTBF: Greater than 12,000 hrs. (excluding  
first 50 hours)

MTTR: 0.5 hours

Drive service life: 36,000 power-on hours,  
minimum

A disk controller 108 is used to control the  
operation of the disk drive 98. It also serves to encode  
and decode the data signals and to format the data so that  
it can be easily and reliably accessed. The controller  
108 preferably supports bad track remapping and error de-  
tection and automatic correction to assure data integrity.  
One such suitable controller is model DTC-5150, available  
from Arrow Electronics, distributor for Data Technology  
Corporation, Santa Clara, California. The specifications  
include:

Operates on the IBM 5150 bus

Error detection and correction up to 4-bit  
bursts

Supports alternate disk track assignments

1                    Supports DMA  
                    6 levels of vectored interrupt  
                    Automatic seek and verify  
                    Controller and disk fault detection  
5                    Sector buffer

                    The modem 100 is used to communicate with the  
central processing unit 16 over the dial-up telephone  
network (DDN). The modem is designed to operate at 300,  
1200 and 2400 baud (bits per second) and to operate either  
10 in the synchronous or the asynchronous mode. It complies  
with the V.22 bis and V.22 A,B standards to provide  
compatibility with a variety of host modems. 2400 baud  
operation is preferably used whenever the telephone line  
quality will support it. 1200 baud operation is an  
15 acceptable fall-back. The modem 100 interfaces to the  
microprocessor 102 via a serial communications interface  
card 110 which is also capable of supporting the above  
modes and baud rates. Screens, programs and data are  
downloaded from the central processing unit 16 to the  
20 Winchester disk 98 and transaction data and terminal  
status are returned to the central processing unit 16, all  
via the modem 100.

                    The preferred characteristics for the modem 100  
are 1200 and 2400 baud rate, auto-dial and auto-answer  
25 features and board-level OEM configuration. In order to  
provide reliable communications and to reduce telephone  
connect charges, a modem is preferred which is capable of  
conforming to the V.22 BIS standard for 1200/2400 baud  
operation. The existence of this fairly recent standard  
30 assures the availability of multiple sources for the modem  
in both the terminal 20 and for the CPU 16. One such  
suitable modem is model R2424DC (with DAA), available from  
Rockwell International Semi-Conductor Products Division,  
Newport Beach, California. The specifications include:  
35                    CCITT V.22 bis, V.22 A,B compatible  
                    Bell 212A and 103 compatible

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Synchronous: 2400 bps, 1200 bps, 600 bps  
+ 0.01%

Asynchronous: 2400 bps, 1200 bps, 600 bps  
+1%, -2.3%, 0-300 bps

2-wire full-duplex

Auto/manual answer

Auto/manual dial, tone or pulse

Power: +5V, +12V, -12V, 3 Watts typical

Size: 3.937" x 4.725"

The microprocessor 102 provides the control for the other components of the terminal 20. It executes the terminal software and interfaces directly or indirectly with all the other electronic components. Associated with the microprocessor 102 is a semiconductor random access memory (RAM) in which the currently executing program is stored along with data to which it requires very fast access. Also associated with the microprocessor 102 is read-only memory (ROM) to hold the power-on (bootstrap) program load and diagnostic routines. The microprocessor 102 also uses interrupt timers and direct memory access (DMA) to facilitate input/output (I/O) operations.

The important characteristics of the microprocessor 102 are compatibility with the color video display graphics and availability of a cost-effective combination of I/O ports required to communicate with the various peripherals. One such suitable microprocessor is model FE 6400/256, available from Faraday Electronics, Palo Alto, California. The specifications include:

256k parity checked RAM

8088 CPU

32k EPROM space

4 DMA channels (one is for refresh)

3 timer channels (one is for refresh)

8 levels of interrupt

1 parallel printer port, Centronix interface

2 serial ports, 8250 UART

IBM compatible keyboard port

1                   Reset port  
                  5 IBM compatible expansion slots  
                  DOS BIOS included on EPROM  
                  Size: 8.5" x 12"  
5                   Operating temperature: 0-55 degrees C  
                  (32-131° F)  
                  Power:  
                  +5V     3A  
                  -12V    50   mA  
10                  +12V    50   mA  
                  (-5V not required by FE6400)

                  The communications cards 110 are used to provide  
                  serial communication interfaces for the modem 100, for  
                  communication to the checkout system 18, and for the  
15                  magnetic stripe card reader 92.

                  The system may require, under certain circum-  
                  stances, two communications cards. Among the suitable  
                  cards available are model CC-232 available from AST  
                  Research, Inc., Irvine, California. The specifications  
20                  include:

                  Supports async, bisync and SDLC/HDLC  
                  Baud rates: 50 to 19,200  
                  Configuration: DTE or DCE  
                  Number of ports: 2  
25                  Uses Zilog SIO processor

                  A clock /calendar combination card 112 contains  
                  both a time-of-day clock and a calendar with rechargeable  
                  battery backup. This is used as a date reference for the  
                  CDR terminal 20 for periods of time when it does not  
30                  communicate with the central processing unit 16. It also  
                  may contain a serial communications port which could be  
                  used to support the asynchronous data link 104 to the  
                  checkout system 18 and a bidirectional parallel port which  
                  could be used to support the sensors and control of the  
35                  magnetic stripe card reader 92 and the printer 94.

                  One such clock/calendar card is the Combo Card  
                  supplied by Apparat, Inc., Denver Colorado. The specifica-  
                  tions include:

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1 Clock/calendar with battery backup  
Parallel I/O port: 8 limbs with handshaking  
Special I/O port: Asynchronous  
50-9600 baud

5 RS232

A power supply (not shown) capable of supplying the necessary regulated voltages will be required. One such suitable power supply is the Model 5110-1 supplied by Power General of Canton, Mass. The specifications are:

10 Line regulation:  $\pm 0.1\%$   
Load regulation:  $\pm 0.2\%$ , +5V output  
 $\pm 1\%$  auxiliary output  
Ripple and Noise (Typ.): 50mV p-p, +5V output  
10mV RMS, all outputs

15 Holdup time: 16 msec  
Operating temperature: 0 degrees C to 70°C  
Output current:

+5V at 10 amps  
-5V at 1 amp  
20 +12V at 1 amp  
-12V at 1 amp  
+24V at 2.5 amps

Size:

4" x 9" x 1.7"

25 G. The Checkout System/Clearing

At the checkout counter, the customer presents his special card or reminder (and, if appropriate, completed request for application) before the product checkout process begins. This is analogous to the conventional practice of presenting coupons before checkout begins.  
30 Since the special card also bears the customer number in "UPC" bar code format, it can be read automatically by the store's scanning system, as indicated at 72 (Fig. 4). The cash register's UPC keypad is used as an alternative method  
35 of identifying the customer and calling up the customer's coupon selections if the special card fails the scanner read or if a customer who does not hold a special card



1 presents a receipt or coupon selection reminder during the  
introductory promotion. Key entry of the receipt number  
or the card number will retrieve the needed information.  
The UPC codes of items customers purchased are scanned or  
5 key-entered into an electronic cash register, as indicated  
at 74.

Upon recognizing that a special card or receipt  
number has been scanned or key entered, the store's local  
processor requests the corresponding list of coupon selec-  
10 tions from the CDR unit 20. The cash register terminal  
(or local processor) compares the customer's selections  
with the products actually being purchased, as indicated  
at 64, and applies credit accordingly, as indicated at 76.  
All discount transactions are reported to the store's  
15 accounts receivable system, electronically or otherwise,  
to properly account for coupons awaiting reimbursement.  
Further, coupons actually redeemed by each customer are  
also reported back to the CDR unit 20.

The ability to process coupon redemptions  
20 after individual item checkout (but before totalling) is a  
desirable feature. However, this may not be compatible  
with the design of some conventional checkout systems,  
especially since they must also process standard paper  
coupons. Similarly, while it is desirable to list items  
25 for full price and print itemized entries for each dis-  
count at the end of the register tape, the existing  
architecture of some conventional checkout systems may  
prevent it. (Sales tax, in this case, must be calculated,  
or adjusted, after coupon redemption and before totalling.)

30 Upon receipt of redemption data from the check-  
out system's processor, the CDR unit 20 stores this infor-  
mation in a file of redemptions by customer, as indicated  
at 78. Later, the local CDR unit 20 is called by the CPU  
16 and this file is transmitted to the CPU 16.

35 Selected "coupons" may remain on the file for up  
to six days given that a seven day interval between uses  
of the special card is preferably defined. The interval

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1 between uses may be varied as desired, and the period  
during which selected coupons may remain on file may be  
varied correspondingly. Likewise, partial redemptions may  
be added as a feature, allowing customers to use some of  
5 their "coupons" immediately and others later in the six  
day period. After six days, the CDR unit 20 preferably  
purges unused "coupons."

All of the information concerning coupons distributed and coupons redeemed is electronically sent to the  
10 operations center CPU 16 for processing. In accordance  
with the invention, the operations center acts as a clearing  
house for these coupons. This may involve merely the  
production of reports for retailers, manufacturers and  
other interested parties based on the electronically  
15 collected data. Specifically, the CPU 16 debits the  
manufacturer's "account" as indicated at 80, and credits  
the merchant's "account" as indicated at 82. The customer  
master file is preferably also updated with all redemption  
information, as indicated at 84. Periodically, this data  
20 can be analyzed and reports generated for each participating  
manufacturer, as indicated at 86. The reports may  
include information about the number of coupons distributed  
and redeemed, buying habits of users, etc. Ultimately,  
extensive demographic data is included in the  
25 reports. Thus, the system eliminates fraud, since there  
is complete control over every coupon distributed and  
redeemed and highly detailed demographic information  
concerning the sale of for each product is available.

#### H. Detailed Software Description

30 Fig. 6 is a key to the symbols employed in the  
flow-chart constituted by Figs. 7-40. Computer processes  
are represented by solid-outline rectangles exemplified at  
114. Manual processes are indicated by broken-outline  
rectangles exemplified at 116. Decisions with yes-no  
35 branches are indicated by hexagons 118. Connectors that  
simply show the connection between adjacent figures are

1 indicated by circles exemplified at 120. Jump connec-  
tors that indicate program jumps are represented by direc-  
tional pentagons exemplified at X. A jump connector can be  
directed in at only one point in a given process flow but  
5 may be directed out at a multiplicity of points. Files are  
indicated by boxes with curved vertical sides as exempli-  
fied at 122.

Primary process flows are shown in Figs. 7-24,  
and secondary process flows are shown additionally in Figs.  
10 25-31. These secondary flows are shown again in Figures  
32-40 describing the optional capture of data relating to  
items purchased by the customer in addition to those  
associated with coupon redemption.

The disclosed flowchart relates to the implemen-  
15 tation of a preferred embodiment of the invention, which,  
however, can be implemented in other ways by those skilled  
in the art. Moreover, many other embodiments of the  
invention will readily occur to those skilled in the art,  
each of which other embodiments can be implemented in  
20 various ways.

#### 1. Primary Process Flows

To begin operations, power to the local CDR unit  
20 is turned on manually as indicated at 124, which boots  
the operating system as indicated at 126. The CDR unit 20  
25 loads diagnostic routines from file 128 into memory as  
indicated at 130 and performs the various routines. As  
indicated at 132, the diagnostic test results are recorded  
in a maintenance status file 134 in memory. These results  
include but are not limited to whether any components are  
30 inoperable, whether a low-paper sensor is turned on, which  
program versions are in use, which data files are on the  
disk, and the current date and time.

The CDR unit 20 then determines, as indicated at  
136, whether the system is operational. If it is not, the  
35 local CDR unit 20 attempts to report the status to the  
central processing unit 16, as indicated at 138. If the  
system is operational, then, as indicated by the connection

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1 140 linking Figs. 7 and 8, the program advances to the  
portion thereof represented in Fig. 8, where it loads the  
operational program, as indicated at 142, from an opera-  
tional program file 144. The local CDR unit 20 reviews  
5 the parameter file 146 for "stale" coupons and ads, as  
indicated at 148.

As indicated at 150, the CDR unit 20 deletes  
corresponding image, text and speech files from appropriate  
files 152. As further indicated at 154, the local CDR unit  
10 20 deletes stale entries from the parameter file 146.

As indicated by connector 158 (Figs. 8 and 9) the  
program then advances to the portion thereof represented by  
Fig. 9, where the CDR unit 20 reviews each record on file,  
as indicated at 160. These records are found in the  
15 coupon selection file 162 and contain transaction numbers,  
coupon numbers of selections, and, for each selection, the  
expiration date, redemption flag and other information.

The CDR unit 20 then determines whether the ex-  
piration date of each coupon is after today's date, as  
20 indicated at 164. If so, a test is performed immediately at  
166 as described below. If not, that particular selection  
is first deleted from the selection transaction record, as  
indicated at 168, and then the program proceeds to step 166.

At step 166, a test is performed to see whether  
25 the redemption flag is on. If not, a test is performed  
immediately at step 170 as described below. If so, the CDR  
20 first deletes that selection from the selection transac-  
tion record, as indicated at 172, and the program then  
proceeds to step 170.

30 At step 170, a test is performed to see whether  
the date in the transaction number was within the current  
coupon time period. If so, then, as indicated by connector  
174 in Figs. 9 and 10, the program proceeds directly to  
step 176 described below in connection with Fig. 10. If  
35 not, the CDR 20 first deletes that entire selection trans-  
action record, as indicated at 178, and then the program  
proceeds to step 176.

1           At step 176 (Fig. 10), the CDR 20 reorganizes  
files and file indexes to minimize search time. The  
reorganized files are stored in the coupon selection file  
162.

5           The CDR 20 then calls up the parameter file 146  
and loads the "promotion" indicator, as indicated at 184.  
At step 186, it performs a test to determine whether the  
"promotion" indicator is on. (It will be recalled that, in  
new installations, where there is preferably a promotional  
10       period of about three months during which selected credit  
cards with a magnetic stripe can be used to activate the  
system.) If the indicator is off, the program proceeds  
directly to step 188 described below. If the indicator is  
on, the CDR 20 first modifies the "insert card" prompt  
15       that is displayed to the customer to include a list of  
other valid card types, as indicated at 190, and then the  
program proceeds to step 188.

          At step 188, the CDR 20 loads parameters for  
current (today's) advertisements. These parameters are  
20       taken from the parameter file 146. As indicated by connec-  
tor 194, Figs. 10 and 11, the program then advances to the  
part thereof shown in Fig. 11, where the CDR 20 performs a  
subroutine for the first ad screen as indicated at 196, and  
repeats the subroutine for subsequent ad screens as often  
25       as the program jumps back from connector E in Fig. 12.

          The jump E is generated if step 200 (Fig. 12),  
which determines whether a card has been inserted, results  
in a negative answer. In response to such negative answer,  
or to completion of step 188 (Fig. 10), the CDR 20 loads  
30       advertisement graphics, as indicated at 202, from an  
advertisement image file indicated at 204. This includes  
advertisement numbers and, for each ad, a digitized image  
in uncompact form. The CDR 20 then loads and overlays  
text, as indicated at 206, this information being taken  
35       from the advertisement text overlay file 208. This contains  
advertisement numbers and, for each ad, the appropriate  
text overlay.

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1           The CDR 20 then loads speech data, as indicated at 210, this being taken from the advertisement speech data file 212. This information contains advertisement index numbers and, for each ad, the appropriate speech data.

5           As connector 214 joining Figs. 11 and 12 indicates, the program then advances to the portion thereof shown in Fig. 12, where the CDR 20 displays advertisements with "insert card" prompts, as indicated at 216.

10          As indicated by jump connector A, appearing at two locations in Fig. 12, as well as elsewhere, step 216 is also initiated in response to an invalid card insertion, and in other ways discussed below.

15          Following step 216, the CDR 20 performs a test, as indicated at 200, to determine whether a card has been inserted manually, as indicated at 220. If not, the program jumps back to step 196 (Fig. 11), as indicated by connector E, runs through the subroutine again, and displays the next ad screen. If the test performed at step 200 indicates that a card has been inserted, the CDR 20 performs  
20          a test, as indicated at 222, to determine whether the card has been read. If the card has not been read, it returns the card and displays an "insert again" prompt, as indicated at 224. The program then jumps back to step 216, as indicated by connectors A. If the card has been read, the  
25          CDR 20 determines the format of the card, as indicated at 226.

30          As indicated by connector 228 linking Figs. 12 and 13, the program then advances to step 230, where the CDR 20 performs a test to determine whether the card is a special card. If this test shows that the card is not a special card, and if the promotion indicator is off, the CDR 20 displays a "card is not a special card" prompt and jumps to step 216 in Fig. 12, as indicated by connectors A in Figs. 12 and 13. If at step 230 the card is determined  
35          not to be a special card and the promotion indicator is on, the CDR 20 performs a special edit routine, as indicated at step 234. Then, as indicated by a connector I in Figs.

1     13 and 21, the program jumps to step 238 discussed below  
in which the CDR 20 compares the issuer's card number to  
information stored in the coupon selection file 162.

5     If the test performed at step 230 (Fig. 13)  
determines that the inserted card is a special card, the  
CDR 20 performs a modulus verification of the card number,  
as indicated at 240.

10     The CDR 20 then performs a test to determine  
whether the card number is valid, as indicated at 242. If  
it is not valid, it displays an "invalid card" prompt, as  
indicated at 244 and, as indicated by connector A (Figs. 12  
and 13) jumps to step 216 in Fig. 12. If the card number  
is determined to be valid at step 242, the CDR 20 compares  
today's date to the card's expiration date, as indicated at  
15     246. Then, as indicated by a connector 248 linking Figs.  
13 and 14, the program advances to step 250, where the CDR  
20 performs a test to determine whether the card has ex-  
pired. If so, the CDR 20 displays an "expired card" prompt,  
as indicated at 252. Then, as indicated by connector A  
20     linking Figs. 14 and 12, the program jumps to step 216.

25     If the test performed at step 250 determines  
that the card has not expired, the CDR 20 compares today's  
date to the card's last period used, as indicated at 252.  
It then performs a test to determine whether the card has  
been unused for the current period. If not, the CDR 20  
displays a "must wait until next time period" prompt, as  
indicated at 256, and, as indicated by the connector A  
linking Figs. 14 and 12, the program jumps to step 216.  
If the test performed at step 254 determines that the card  
30     has been unused for the current period, the CDR 20 displays  
coupon selection instructions, as indicated at step 258.

35     As indicated by a connector B linking Figs. 14  
and 21, step 258 is also initiated in response to a  
negative answer to a test performed at step 262 discussed  
below.

       A connector 264 linking Figs. 14 and 15 indicates  
that the program then advances to the portion thereof

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1 shown in Fig. 15, where the CDR 20 assigns a receipt or  
transaction number (i.e., a next session number, as  
indicated at 266). This could include the card number,  
date, store number, and a sequential number assigned to  
5 each customer session.

The CDR 20 next compares the date and session  
number of the current user to those filed for the winner  
of the special coupon, as indicated at 268. The informa-  
tion relating to the winner of the special coupon is taken  
10 from the parameter file 146 and contains the date and ses-  
sion number of the winner and other relevant information.

Next a test is performed at step 272 to determine  
whether the inserter of the card is the winner of a  
special coupon. If so, the program skips to the special  
15 coupon process, as indicated by a connector C linking  
Figs. 15 and 22.

If the test performed at step 272 determines  
that the inserter of the card is not a winner of the  
special coupon, the CDR 20 loads the parameters for today's  
20 coupons, as indicated at 276. This information is taken  
from the parameter file 146.

Then, as indicated by a connector 280 linking  
Figs. 15 and 16, the program advances to the portion  
thereof represented in Fig. 16, where the CDR 20 performs  
25 a series of steps for each coupon screen in today's set,  
as indicated at 282. As indicated by a connector F  
linking Figs. 16 and 18, the program also jumps to step  
282 in response to a negative answer to a test performed  
at step 286 discussed below.

30 The steps performed following step 282 include  
loading coupons, as indicated at 288. This information is  
taken from a coupon image file 290 and contains coupon  
index numbers and, for each coupon, a digitized image in  
uncompacted form.

35 Next, the CDR 20 loads and overlays text, as  
indicated at 292. This information is taken from the  
coupon text overlay file.



1           Next, the CDR 20 loads speech data, as indicated  
at 296. This information is taken from the coupon speech  
data file 298 and contains coupon numbers and, for each  
coupon, appropriate speech data.

5           As indicated by a connector 300 linking Figs. 16  
and 17, the program advances to the portion thereof  
represented by Fig. 17, where the CDR 20 then determines  
for each coupon the number remaining to be issued, as  
indicated at 302. This information is taken from the  
10 parameter file 146 and includes coupon numbers, the  
remaining number of coupons to be issued for each, and  
other information.

          At step 306, a test is performed to determine  
whether the remaining number of coupons exceeds zero. If  
15 so, the CDR 20 proceeds directly to step 308 discussed  
below. If not, the CDR 20 first blanks out that coupon on  
the screen display to prevent its selection, as indicated  
at 309, and then proceeds to step 308.

          At step 308, the CDR 20 displays coupon screens  
20 and "make selection" prompts. Step 308 is also initiated,  
as indicated by connector D linking Figs. 17 and 18, in  
response to step 312 discussed below.

          After step 308, the program moves to step 314.  
The customer manually (by touching an appropriate location  
25 on the screen) selects one coupon from each screen, as  
indicated at 316. At step 314, the CDR 20 equates the  
location touched on the screen to the coupon selected.

          As indicated by a connector 318 linking Figs. 17  
and 18, the program then moves to step 320, at which a  
30 determination is made whether the coupon selection is  
valid. If not, then, as indicated at step 312, the CDR 20  
displays a "repeat selection" prompt and jumps, as indicated  
by connector D, to step 308 in Fig. 17, thereby prompting  
the customer to try again.

35           If the step performed at 320 determines that the  
coupon selection is valid, then the CDR 20 records the cou-  
pon number under the receipt number, as indicated at 322.

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1           The program next moves to step 286 briefly  
mentioned above and performs a test to determine whether  
this is the last coupon screen. If it is not, then, as  
connector F indicates, the program jumps to step 282 (Fig.  
5   16) and repeats the process for the following screen. If  
the test performed at 286 determines that it is the last  
coupon screen, then the CDR 20 decrements counters for  
each coupon selected, as indicated at 324, and enters this  
information in the parameter file 146.

10           Then, as indicated by connector 328 linking  
Figs. 18 and 19, the program advances to the portion  
thereof shown in Fig. 19, where the CDR 20 loads the  
necessary data for each coupon selected, as indicated at  
330. This information is taken from the parameter file  
15   146 and contains coupon index numbers, product UPC code,  
product description, discount value of the coupon, expira-  
tion date of the coupon, and other pertinent information.

          The program next advances to step 332, where the  
CDR 20 writes the selection record to the coupon selection  
20   file 162. This file contains the transaction number and,  
for each coupon selected, the product UPC code, the  
discount value of the coupon, and the expiration date of  
the coupon.

          The program next advances to step 336 at which  
25   the CDR 20 prints the coupon selection list for the  
benefit of the customer and dispenses the list to the  
customer. This printout contains the receipt number and,  
for each coupon selected, a product description, the  
coupon discount value, and the coupon expiration date.  
30   The customer takes the coupon selection reminder with him  
while he shops, as indicated at 338.

          The program next advances to step 340 at which a  
test is performed to determine whether a special card is  
being used. If not, then, as indicated by a connector 342  
linking Figs. 19 and 20, the program advances to step 344  
35   discussed below. If the test performed at step 340 shows  
that a special card was used, the CDR 20 first updates the

1 special card with the code indicating the current time  
period, as indicated at 346, and the program then advances  
to step 344 (Fig. 20). At step 344, the card is returned  
to the shopper, who removes the card, as indicated at 348.

5 After the return of the card as indicated at  
step 344, the program loops back and optionally displays  
at least one advertising screen, as indicated at 350 and  
by jump E linking Figs. 20 and 11.

It will be recalled that in Fig. 13 at step 230,  
10 a test was performed to determine whether the card inserted  
by the customer was a special card and that, if it was not,  
and if the promotion indicator was on, a special edit  
routine was performed, indicated at 234. The jump I  
thereupon initiated goes to Fig. 21. At step 238 in Fig.  
15 21 the CDR 20 compares the issuer's card number to informa-  
tion contained in the coupon selection file 162. At step  
262, as briefly mentioned above, a test is performed to  
determine whether a previous use of the card is already on  
file. In case the answer is in the negative, the program  
20 jumps as indicated by connector B linking Figs. 21 and 14,  
as discussed above, and coupon selection instructions are  
displayed. In case the answer to the test performed at  
step 262 is in the affirmative, the CDR 20 displays a  
"card used previously" prompt, as indicated at 356, and,  
25 as indicated by connector A, loops back to step 216 (Fig.  
12) discussed previously.

It will further be recalled in connection with  
Fig. 15, step 272, that a test was performed to determine  
whether the customer who has inserted the card is a win-  
30 ner of the special coupon. If the answer is in the  
affirmative, then, as indicated by connector C, linking  
Figs. 15 and 22, the routine beginning at step 358 is  
initiated by loading the special coupon parameters. This  
information is taken from parameter file 146 and includes  
35 description of the prize won and the expiration date.

The CDR 20 next loads the special coupon gra-  
phics, as indicated at 362. This information is taken

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1 from a special coupon image file 364.

The CDR 20 next loads and overlays text, as indicated at 366. This information is taken from a special coupon text overlay file 368.

5 The CDR 20 next loads speech data, as indicated at 370, from a special coupon speech file 372. Then, as indicated by a connector 374 linking Figs. 22 and 23, the program advances to the portion thereof shown in Fig. 23, where the CDR 20 displays the special coupon, as indicated  
10 at 376.

Then, as indicated at step 378, the CDR 20 writes the special coupon winner record into a special coupon winner file 380.

The CDR 20 next prints the special coupon and  
15 dispenses it, as indicated at 382, and the customer takes the special coupon, as indicated at 384.

At step 386, a test is performed to determine whether a special card was used by the customer. If not, then, as indicated by a connector 388 linking Figs. 23 and  
20 24, the program advances to the portion thereof shown in Fig. 24, and the card is immediately returned, as indicated at 390. If the test performed at step 386 determines that a special card was used, the special card is first updated with the current time period (and optionally other information), as indicated at 392, and then returned as indicated  
25 at 390. The customer then removes the card, as indicated at 394. Then, as indicated by connector E linking Figs. 24 and 11, the program loops back to step 196 discussed above.

30 2. Secondary Process Flows (Without  
Optional Purchase Data Capture

Figures 25-31 show secondary process flows without the option to perform purchase data capture activated.

Periodically, the CDR unit 20 receives a request from the checkout system 18 (Fig. 1) for selection data, as  
35 indicated at 396 (Fig. 25). This request contains the card number of the customer (as read by the checkout scanner) so that the CDR 20 can identify the customer. The CDR 20 then

1 searches the coupon selection file 162 for the transaction  
record, as indicated at 400. At step 402, a determination  
is made whether the transaction record is found. If not, it  
returns a "record not found" message to the automated check-  
5 out system 18, as indicated at 404. If the determination  
made at step 402 is that the record is found, the program  
flags the record as in use, as indicated at 406. This  
information is recorded in the coupon selection file 162.

Then, as indicated by a connector 410 linking  
10 Figs. 25 and 26, the program advances to the portion  
thereof shown in Fig. 26, and the CDR 20 sends the selec-  
tion transaction record to the checkout system 18, as  
indicated at 412.

Next, the CDR 20 receives a confirmation of  
15 receipt from the checkout system 18 or retransmits the  
message returning the selection transaction record, as  
indicated at 414.

Alternatively, coupon selection data may be sent  
to the checkout system as the CDR unit 20 completes each  
20 selection session.

The CDR 20 then receives the redemption record  
from the checkout system 18, as indicated at 416. As  
indicated at 418, this is added to the coupon redemption  
file 420. Then, as indicated by a connector 422 linking  
25 Figs. 26 and 27, the program advances to the portion  
thereof shown in Fig. 27 and the CDR 20 sends confirmation  
of receipt of the message back to the checkout system 18,  
as indicated at 424.

As indicated at 426, the CDR 20 flags selections  
30 redeemed in the coupon selection file 162. Then, as indi-  
cated at 430, the CDR 20 removes the "in use" flag from  
the transaction record and writes this information in the  
coupon selection file 162.

Next, the CDR 20 receives a request for redemp-  
35 tion data from the CPU 16, as indicated at 434. As indi-  
cated by a connector 436 linking Figs. 27 and 28, the pro-  
gram then advances to the portion thereof shown in Fig. 28,  
and the CDR 20 responds with maintenance status at step 438.  
This information is derived from the maintenance status

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1           The CDR 20 either receives confirmation of receipt of the transmission or retransmits the message, as indicated at 442.

5           The CDR 20 then marks the end of the file, as indicated at 444. This mark is entered in the coupon redemption file 420.

          The CDR 20 then calls up the coupon redemption file 420 up to the above mentioned marker and transmits the data to the CPU 16, with controls, as indicated at 448.

10          Connector 450 links Figs. 28 and 29. The CDR 20 either receives confirmation of receipt from the CPU 16 or retransmits the message, as indicated at 452 in Fig. 29.

          As indicated at 454, the CDR 20 deletes the  
15   marker which was entered at step 444 and the records preceding it either immediately or, optionally, at a later time. This information is recorded in the coupon redemption file 420. As indicated at 456, the CDR 20 then receives an instruction to receive new files. For each  
20   such file, the program runs through the subroutine beginning at step 456 and ending at jump H in Fig. 31. As indicated at 458, the CDR 20 first receives information on a new file to be transferred from the CPU 16. This information includes transmission controls, file type and  
25   identification, segment number (if multiple parts) and dates for usage.

          Connector 460 links Figs. 29 and 30. As indicated at 462, the CDR 20 then receives a new file. This may include image files, text overlay files, speech data  
30   files, parameter files and programs. At step 464, a determination is made whether an image file is included. If not, the new file received at step 462 is immediately written into the disk, as indicated at 466. If the determination made at step 464 reveals that an image file is  
35   included, the data is first uncompact, as indicated at 468, and then written into the disk as indicated at 466. This information is entered in an appropriate file 470.

1           Alternatively, image data transmitted before it  
is to be used may be stored on the disk in compacted form  
and uncompactd when it is to become active. This would  
save disk space.

5           The CDR 20 next sends confirmation of receipt,  
as indicated at 472.

Connector 474 links Figs. 30 and 31. At step  
476 (Fig. 31) a determination is made whether the final  
segment has been received. If not, then, as indicated by  
connector H linking Figs. 31 and 29, the CDR 20 loops back  
for the next file. If the determination made at step 476  
reveals that the final segment has been received, the CDR  
20 first updates the parameter file with data such as  
coupon index number, dates for use, etc. as indicated at  
480, and then loops back for the next file.

3. Secondary Process Flows  
With Optional Purchase Data Capture)

Figs. 32-40 show secondary process flows with  
the option to perform purchase data capture activated.

20           Periodically, the CDR 20 receives a request from  
the checkout system 18 for data regarding the selections  
made by a particular customer, as indicated at 482. This  
request contains the customer's card number. The CDR 20  
searches the coupon selection file 162 for the selection  
25 record, as indicated at 484.

At step 486, the CDR 20 makes a determination  
whether the selection record has been found. If not, it  
returns a "record not found" message to the automated  
checkout system 18, as indicated at 488.

30           If the determination made at step 486 reveals  
that the customer selection record has been found, the CDR  
20 flags the record as in use, as indicated at 490, and  
records this in the coupon selection file 162.

Connector 492 links Figs. 32 and 33. At step  
35 494, the CDR 20 checks the parameter file 146 for a pur-  
chase data capture indicator. At step 496, the CDR 20  
makes a determination whether the indicator is on. If it

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1 is not on, the CDR 20 returns the selection record to the automated checkout system 18, as indicated at 498.

If the determination made at step 496 reveals that the indicator is on, the CDR 20 first flags the selection record for full purchase data capture, as indicated at 500, and then returns the selection record as indicated at 498.

The CDR 20 then either receives confirmation of receipt of the transmission from the automated checkout system 18 or retransmits the message, as indicated at 502. (Alternatively, the CDR unit 20 sends the coupon selection data to the checkout system at the end of each selection session).

Connector 504 links Figs. 33 and 34. At step 506 the CDR 20 receives the redemption record from the checkout system 18. At step 508 the CDR 20 records this information in the coupon redemption file 420. This information contains the selection transaction number and for each transaction the selections redeemed.

At step 510 the CDR 20 makes a determination whether full purchase data has been appended. If the determination at step 510 reveals that the full purchase data has not been appended, the program jumps to step 512 (Fig. 35) discussed below, as indicated by connector J. If the determination made at step 510 reveals that full purchase data has been appended, the CDR adds this information to the purchase file 516 as indicated at 518. This information includes the transaction number and, for each purchase, the UPC product code and price.

Connector 520 links Figs. 34 and 35. At step 512, the CDR 20 sends confirmation of receipt. This part of the program is reached via either of the connectors J and 520. At step 522, the CDR 20 flags the selections redeemed and enters the information in the coupon selection file 162. At step 524, the "in use" flag is removed from the selection record, and this information is recorded in the coupon selection file 162. At step 526, the CDR 20 receives a request for redemption data from the CPU 16.



1           Connector 528 links Figs. 35 and 36. At step 530  
the CDR 20 responds to the CPU 16 with maintenance status  
as read from the maintenance status file 134.

5           At step 532, the CDR 20 receives confirmation of  
receipt from the CPU 16 or retransmits the message. At  
step 534, the CDR 20 marks the end of file and records this  
in the coupon redemption file 420. At step 536, the CDR 20  
transmits the data to the CPU 16, with controls, as read  
from the coupon redemption file 420.

10          Connector 538 links Figs. 36 and 37. At step  
540, the CDR 20 receives confirmation of receipt from the  
CPU 16 or retransmits the message.

          At step 542, the CDR 20 deletes the marker and  
the records before it in the coupon redemption file 420.  
15       At step 544, the CDR 20 receives a request for purchase  
data from the CPU 16. At step 546, the CDR 20 marks the  
end of the file and records this in the purchase file 516.

          Connector 548 links Figs. 37 and 38. At step  
550, the CDR 20 transmits data up to the marker from the  
20       purchase file 516 to the CPU 16 (with controls). At 552,  
the CDR 20 receives confirmation of receipt from the CPU 16  
or retransmits the message.

          At step 554, the CDR 20 deletes the marker and  
the records before it in the purchase file 516 either  
25       immediately or at a later time. At step 556, the CDR 20  
receives an instruction to receive new files. For each  
such file, the program performs the subroutine beginning  
at step 556 and ending at jump H in Fig. 40.

          It should be noted that all references here and  
30       in other places to the definition of records may alterna-  
tively be deferred for some period of time to allow for  
backup and recovery.

          Connector 558 links Figs. 38 and 39. At step  
560, the CDR 20 receives information on a new file to be  
35       transferred from the CPU 16. This information includes  
transmission controls, file type and identification, the  
segment number (if multiple parts) and the dates for usage.

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1 At step 562 the CDR 20 receives the new file. The file may be one of the following types of files: image files, text overlay files, speech data files, parameter files and programs.

5 At 564 a determination is made whether an image file is included. If not, the information is written into the disk, as indicated at 566, in an appropriate file 568. If the determination made at step 564 reveals that an image file is included, the data optionally is first uncompactd,  
10 as indicated at 570, and then written into the disk, as indicated at step 566.

Connector 572 links Figs. 39 and 40. The CDR 20 then sends confirmation of receipt, as indicated at 574. At step 576 a determination is made whether the  
15 final segment has been received. If not, the program immediately loops back to step 556 (Fig. 38) for the next file, as indicated by connector H. If the determination made at step 576 reveals that the final segment has been received, the parameter file 146 (not shown in Fig. 40) is  
20 first updated, as indicated at 578, and the program then loops back as indicated by connector H.

#### J. Modifications and Embellishments

In accordance with the invention, coupons can alternatively or additionally be distributed to customers  
25 at home. This would require the placement of local processing units in each limited geographic region where the service is offered. Consumers could call a local telephone number to contact the local processing unit (LPU). The LPU would advise the identified consumer of coupons offered  
30 that week. After choosing coupons, the consumer could also choose to shop for supermarket items on the system. After the customer hangs up, the LPU may send the user's file to the appropriate supermarket's CDR unit. The list of items to be purchased could also be sent to the central computer of  
35 the supermarket that was identified by the customer. To redeem chosen coupons, the customer would go to the supermarket which was designated when coupons were chosen. The

1 same card number that was used during the selection  
process must be used on redemption to recall the coupons.  
Communications could be via a cable system, satellites,  
telephone, etc.

5 Many of the functions performed by the local CDR  
units 20 can be performed by the checkout system 18. For  
example, the National Semiconductor Datachecker/DTS 1100  
POS Control System Processor when configured correctly,  
can perform communications, data storage, and manipulation  
10 functions among others. This may substantially decrease  
the cost of implementing the system in a store, since the  
processor controlling the checkout system would be neces-  
sary with or without the coupon system, and its presence  
would eliminate the need for a complex kiosk.

15 As a supplemental feature of the invention,  
surveys may be taken. By asking a customer a series of  
questions requiring a "touch" answer, the kiosk could take  
a survey, or poll voters, for example. Catalog sales may  
also be offered over the system, since the user's home  
20 address will be known. Also contemplated is the presenta-  
tion of various sized coupons, and the presentation of  
coupons where a customer may choose a limited number of  
coupons. The latter may be useful where it is desired to  
increase the number of times a coupon is seen relative to  
the number of times it is chosen.

25 A "zoom" feature may be provided whereby, by  
touching a particular area on a first display screen,  
the customer causes that display to enlarge, or a set of  
additional related displays to appear. For example, if  
30 the first screen listed numerous categories of items, with  
pets as one category, touching the "pets" area on the  
screen may cause a series of pet coupons to be displayed.  
This would allow the inclusion of hundreds of coupons on  
the kiosk, without forcing the customer to stand at the  
kiosk for many minutes to review all available selections.  
35 Another application of this feature may be to display  
recipes when a certain coupon is chosen, and then to show

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1 the location or nutritional value of a particular item in  
the recipe when that item is touched.

The number of the receipt issued by the CDR unit  
20 does not necessarily have to be the account number of  
5 the card which was used on coupon selection. It could be  
another number with fewer digits which is associated with  
the account number associated with the list of coupons  
chosen. This would decrease the time taken by the cashier  
to key enter the number on the receipt. Another possibili-  
10 ty would be to print the number on the receipt in UPC code  
format so that it could be scanned rather than key entered.  
This would further decrease the time taken by the cashier  
to redeem the coupons. It would require a printer capable  
of printing UPC code with a density that would required to  
15 be read by a standard scanning system.

An alternative way of applying for the special  
card is for the customer to enter data through a specified  
side of the kiosk. The "keyboard" to enter name, address,  
etc. could be depicted on the screen, and the user could  
20 touch the "keys" to enter the data. The information would  
be stored locally until the next communication between the  
operations center 8 and the CDR unit 20.

An important feature of the invention is that a  
customer's demographic information may be magnetically  
25 encoded on the card such that when the customer is identi-  
fied by CDR unit 20, possibly by spoken name, certain  
select coupons will be shown to the particular individual  
who meet preselected criteria. This would allow a manufac-  
turer to give coupons to customers (for example) who chose  
30 another manufacturer's coupons the preceding week. It  
would also allow many coupons to be in the system, without  
displaying all coupons to all customers. As another exam-  
ple, the account number may indicate that a particular  
cardholder owns a dog. This affords an opportunity to  
35 display to the cardholder a selection of coupons appropri-  
ate for dog owners, while omitting such a display in the  
case of other cardholders who do not own dogs.

1           In accordance with the invention, all of the  
products purchased by a customer could be "saved" in a  
modified kiosk, or, alternatively, in the POS system  
storage. Those purchases could then be associated with  
5   the purchaser, whose name and data would be known.

        Sensitive data communicated between the host and  
local unit may be encrypted. Furthermore, authorization  
capability for sensitive data (e.g. derived from the  
operations center) is also possible.

10          Non-scanning equipped stores that only have  
electronic cash registers could use the system by having  
cashiers key enter the UPC codes for the purchased pro-  
ducts. This is already standard procedure in many super-  
markets.

15          When an invalid card is inserted or an invalid  
use is attempted, there are several possibilities besides  
displaying a screen that describes the invalidity of the  
use. For example, if the notation indicates that the user  
accessed the system in that type of retail outlet during  
20   that week (or other predetermined time period), a second  
notation may be made on a magnetic strip of card indicating  
one attempted invalid use. A single screen may then appear  
explaining the reason why the card is not valid in that  
type of store for the remainder of the week. If the user  
25   then attempts to use the same card a third time, in the  
same type of outlet that week, a third note may be made on  
the magnetic stripe which permanently invalidates the card  
in all retail stores. Alternatively, the card reader may  
simply "swallow", or refuse to disgorge, the inserted card.  
30   In either case the user will then see an explanation on  
the screen of the action that has been taken as a result  
of the user's attempts to circumvent the system.

        If the notation on the card indicates that the  
user accessed the system in a specific retail outlet  
35   during that week (or other predetermined time period), the  
unit may retrieve the user's file and list coupons already  
chosen and not redeemed. It may also re-offer coupons

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1 which were not chosen. It would not re-offer coupons that  
have already been redeemed. If the card was already used  
during that period in the same type of retail outlet then  
a screen is displayed to inform the user that use of the  
5 card in that type of retail outlet is not possible until  
the beginning of the next time period but that use of the  
card is possible in another type of retail store. New  
instructions for the display of new coupons may be stored  
and retrieved when the limit on the distribution of a  
10 particular coupon has been reached.

The system may be "on-line" wherein constant  
communications between an operations center and local  
stations would allow customers to use various supermarket  
CDR units within one week, because their prior selections  
15 can be retrieved from the operations center. Each user  
could also be specifically identified by last week's  
purchases or coupons or any other variable that is stored  
in the substantial data base in the operations center.

It is further contemplated that the CDR unit 20  
may contain a scanner capable of reading paper coupons  
with UPC codes. After inserting the card, a customer  
would insert paper coupons into a slot, similar to the  
ones used in dollar bill change machines. The UPC code on  
the coupons would be read, and then would be added to the  
25 electronic list of coupons available for redemption when  
the card is presented at the checkout. This would inte-  
grate currently used systems into the invention while  
significantly improving such systems by substantially  
reducing redemption and clearing costs. Once inserted and  
30 read, paper coupons would be destroyed by the CDR unit.

A still further possibility is that information  
regarding the coupons selected by a customer could be  
recorded on the customer's special card at the time of  
coupon selection. The information recorded on the card  
35 could then be read directly at the checkout station for  
redemption and subsequent clearing.

1 J. Summary

Thus there is provided in accordance with the invention a novel, highly-effective and efficient method for distributing, redeeming and clearing coupons. The invention solves the problems of the prior art noted above by increasing coupon redemption rates, reducing the cost of coupon issuance, redemption and clearing, eliminating the misredemptions characteristic of conventional systems, and providing other benefits as noted above.

10 The invention is particularly adapted for distributing, redeeming and clearing coupons of the "cents-off" kind used to promote the sale of merchandise in supermarkets, drugstores and hardware stores. The invention can also be employed in conjunction with coupons offering  
15 substantial discounts, amounting, for example, to several or many dollars. Such coupons may for example be used to promote airline travel, car rental, reservations in a particular hotel, etc. The invention can moreover be employed in conjunction with coupons offering free goods  
20 and services.

Many modifications of the preferred embodiments of the invention disclosed above will readily occur to those skilled in the art upon consideration of this disclosure. For example, the specific hardware components  
25 described above are merely exemplary, and other components can readily be substituted therefor without departing from the spirit and scope of the invention. Similarly, the program steps as outlined in the flowcharts are merely exemplary, and other programs or even hard-wired apparatus  
30 for accomplishing the same purposes can be developed by those skilled in the art having the benefit of this disclosure.

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What is claimed is:

1. Apparatus for redeeming coupons and the like, said apparatus comprising  
     means for recording a customer's selection of coupons,  
     checkout means at a store checkout station for recording items purchased in the store by the customer, and  
     matching and crediting means for determining any matches between the coupons selected and the items purchased and for crediting the customer in accordance with the terms of the matched coupons.

2. Apparatus for distributing and redeeming coupons and the like, said apparatus comprising  
     display, selection and recording means for presenting to a customer a display of coupons, for enabling the customer to make a selection of coupons from the display, and for recording the selection,  
     identification and checkout means for identifying the customer at a store checkout station as the one who made the selection and for recording items purchased in the store by the customer, and  
     matching and crediting means for determining any matches between the coupons selected and the items purchased and for crediting the customer in accordance with the terms of the matched coupons.

3. Apparatus according to claim 2 including clearing means responsive to said matching and crediting means for debiting the issuer of the matched coupons and crediting the store at which the coupons were redeemed.

4. Apparatus according to claim 2 wherein said display, selection and recording means comprises a video monitor for presenting said display and a touch screen for enabling said customer to make said selection.



5. Apparatus according to claim 2 wherein said display, selection and recording means further comprises printing means for printing a receipt listing said selections and issuing said receipt to said customer as a shopping aid.

6. Apparatus according to claim 5 wherein said receipt includes a receipt number which can be key-entered in said identification and checkout means in order to identify said customer as the one who made said selection and to enable call-up of said selection from said display, selection and recording means.

7. Apparatus according to claim 2 wherein said display, selection and recording means comprises a plurality of electronic display screens, at least a first of said screens being dedicated to a use including display of said coupons.

8. Apparatus according to claim 7 further comprising special card means facilitating identification of customers to said display, selection and recording means, wherein said different use includes the presentation of a display facilitating applications by customers for said special card means.

9. Apparatus according to claim 2, wherein said display, selection and recording means includes means for recording data on a card associated with a customer.

10. Apparatus according to claim 9, wherein said display, selection and recording means includes means for identify a customer identification code on said card.

11. Apparatus according to claim 9, wherein said display, selection and recording means further includes control means responsive to data previously recorded on a customer card.

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12. Apparatus according to claim 11, wherein said last name means is capable of preventing coupon selection by said customer.

13. Apparatus according to claim 2 wherein said identification and checkout means comprises an automated scanning checkout system.

14. Apparatus according to claim 2 wherein said matching and crediting means comprises an automated scanning checkout system.

15. Apparatus according to claim 2 comprising means for obtaining demographic data about users of said apparatus, means for correlating said demographic data with said selections, and means for periodically generating reports based on said correlations.

16. Apparatus for distributing and redeeming cents-off merchandise coupons and the like, said system comprising  
a central processing unit,  
a data entry system for entering into said central processing unit alphanumeric data relating to coupons to be distributed,

an image capture system for supplying digitized image data relating to said coupons to said central processing unit, and

a local coupon distribution and redemption unit at a remote location connected to said central processing unit for receiving said alphanumeric and image data and electronically displaying and distributing coupons corresponding to said data.

17. Apparatus according to claim 16 further comprising an automated scanning checkout system connected to said coupon distribution and redemption unit for determining any items purchased by said customers in said store,

further comprising card means cooperating with both said distribution and redemption unit and said checkout system, said distribution and redemption unit, checkout system and card cooperating to issue coupons only to holders of said card and to match coupon selections of each holder to purchases made in that store by the holder, whereby the holder is electronically credited with the value of the coupons selected in accordance with the terms of each coupon.

18. Apparatus according to claim 17 comprising security means for detecting attempted invalid use of said card, for preventing such invalid use, and for communicating the action taken to the holder attempting such invalid use.

19. Apparatus according to claim 17 comprising security means for detecting attempted invalid use of said card, for invalidating said card in response to such attempted invalid use, and for communicating the action taken to the holder attempting such invalid use.

20. Apparatus according to claim 19 wherein said card includes a magnetic stripe and said security means comprises means for recording an invalidating mark on said magnetic stripe in response to such attempted invalid use.

21. Apparatus according to claim 17 comprising means for limiting the number of times said card can be used under preselected circumstances.

22. Apparatus according to claim 21 wherein said means for limiting the number of times said card can be used in a particular type of store for unit of time comprises means for recording the date of a given use of a given card in a particular type of store,

means for ascertaining the date of a subsequent attempted use of the same card in the same type of store,

means for comparing the two dates, and

-58-

means for invalidating said subsequent attempted use if said comparison of dates indicates that the time elapsed since said given use is less than a predetermined interval.

23. Apparatus according to claim 17 wherein said card is a conventional credit card issued to a plurality of credit card holders under different account numbers, each credit card having a magnetic stripe.

24. Apparatus according to claim 17 wherein said card comprises a special card issued to a plurality of holders under different account numbers, each card having a magnetic stripe, and means in said central processing unit for storing said account numbers and demographic data relating thereto and for generating periodic reports including demographic data about purchasers of said items.

25. Apparatus according to claim 17 including means for limiting the number of coupons for a particular item distributed in a given store in a given time period.

26. Apparatus according to claim 25 wherein said means for limiting the number of coupons for a particular item distributed in a given store in a given time period comprises means in said local unit for storing a number corresponding to the maximum number of a particular coupon authorized for distribution in that store during that time period, counting means for counting the number of selections of that coupon, means for comparing the stored number and the number counted by said counting means, and means actuated when said stored number and said counted number are equal for preventing further distribution of said coupon during said time period.

27. Apparatus for distributing, redeeming and clearing coupons and the like of an issuing entity, said apparatus comprising

display, selection and recording means for presenting to a customer a display of coupons, for enabling the customer to make a selection of coupons from the display, and for recording the selection,

identification and checkout means for identifying the customer at a store checkout station as the one who made the selection and for recording items purchased in the store by the customer,

matching and crediting means for determining any matches between the coupons selected and the items purchased and for crediting the customer in accordance with the terms of the matched coupons, and

central processing means responsive to said matches for debiting said issuing entity and crediting said store with respect to said matched coupons.

28. A method of distributing and redeeming cents-off merchandise coupons and the like, said method comprising the steps of

presenting to a customer in a particular store an electronic display of coupons valid for use at least in that store,

enabling the customer to make a selection of coupons from the display,

recording the selection of coupons made by the customer,

subsequently identifying the customer at a store checkout station as the one who made the selection,

recording items purchased in the store by the customer,

electronically determining any matches between the coupons selected and the items purchased, and

electronically crediting the customer in accordance with the terms of the matched coupons.

29. A method according to claim 28 comprising the step of re-offering to the customer coupons not previously

-60-

selected by the customer during subsequent visits by the customer to the store within a predetermined time period.

30. A method according to claim 28 comprising the step of informing the customer during subsequent visits by the customer to the store within a predetermined time period that selection of additional coupons for redemption in stores of the same type is not possible during said time period.

31. A method according to claim 28, further including the steps of electronically debiting the issuer of the redeemed coupons and electronically crediting the store at which said coupons were redeemed.

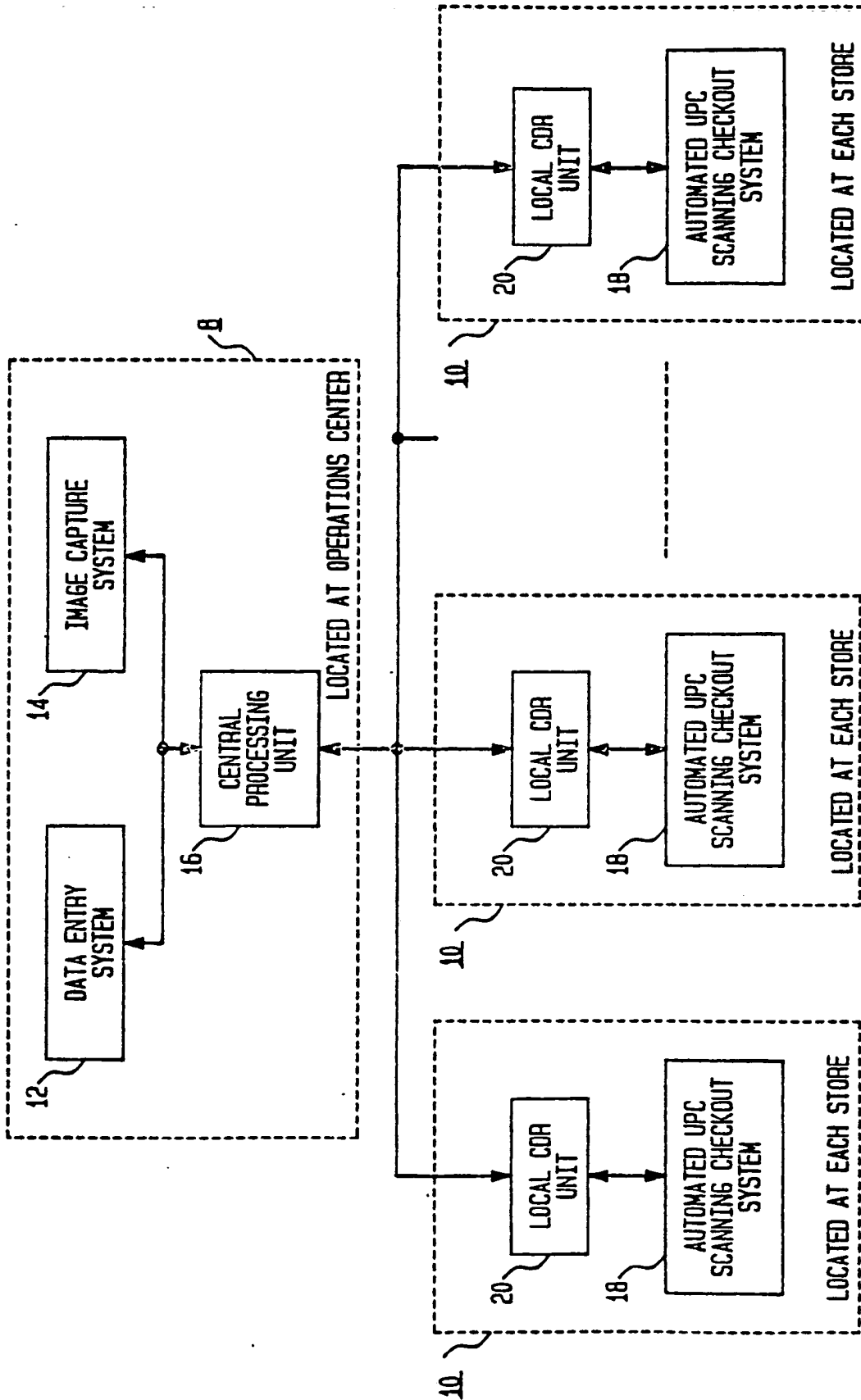


FIG. 1

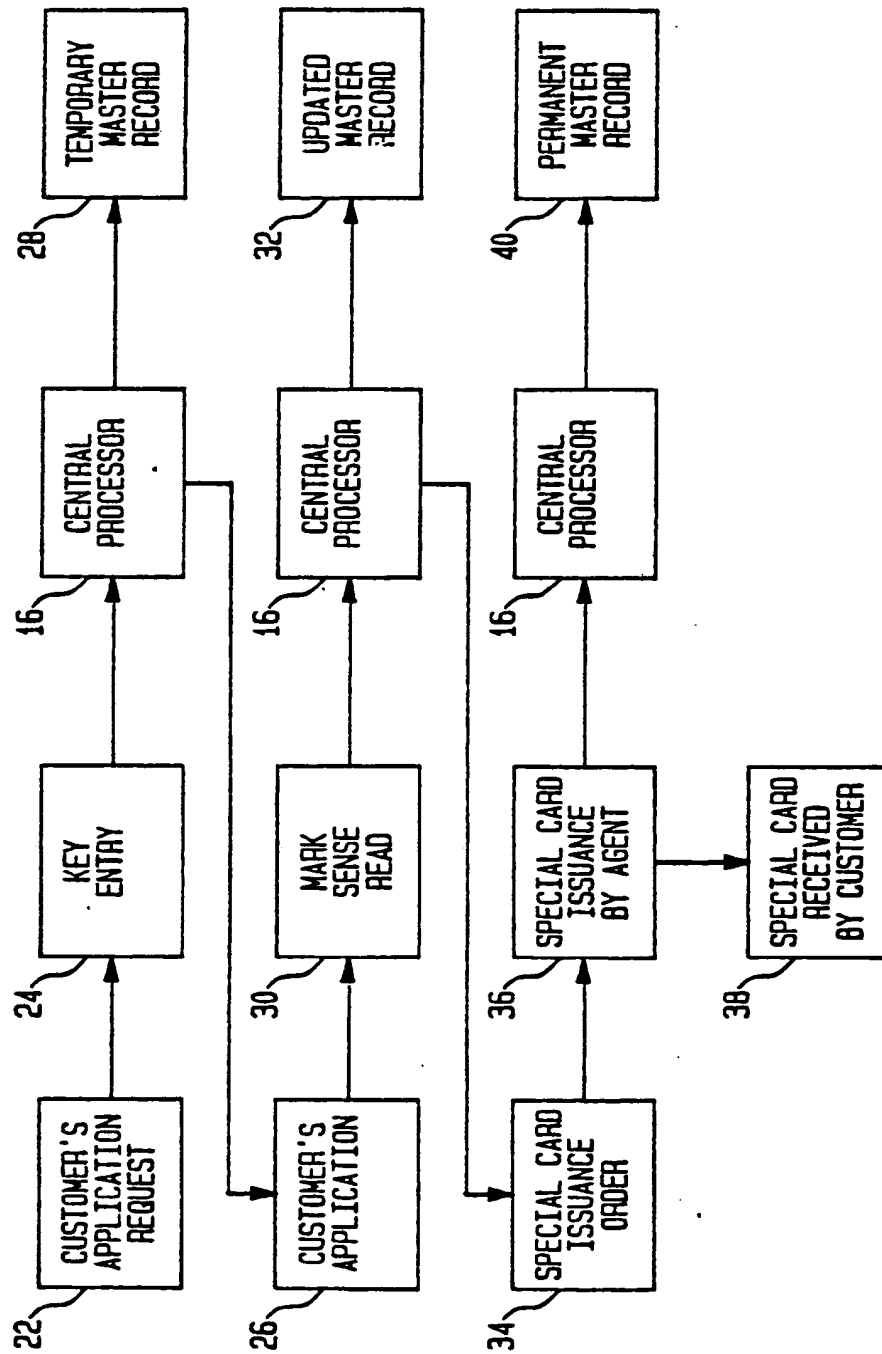


FIG. 2



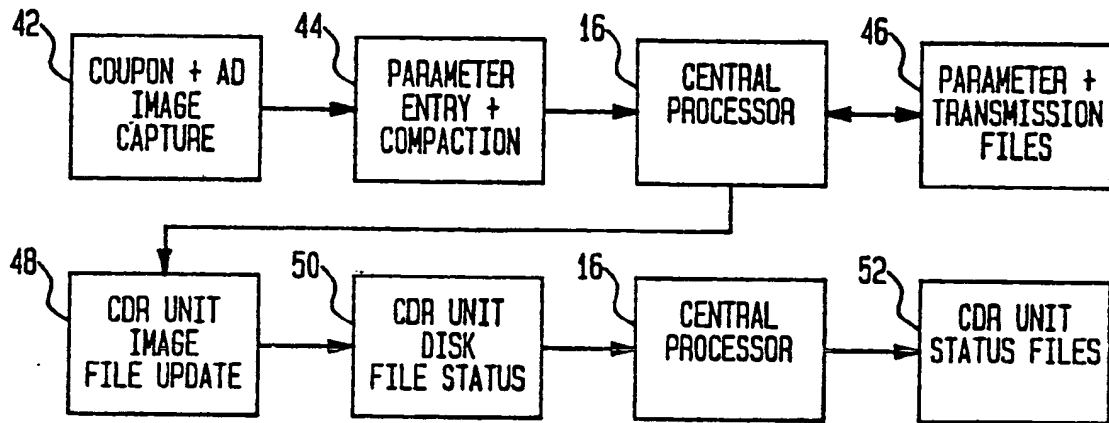
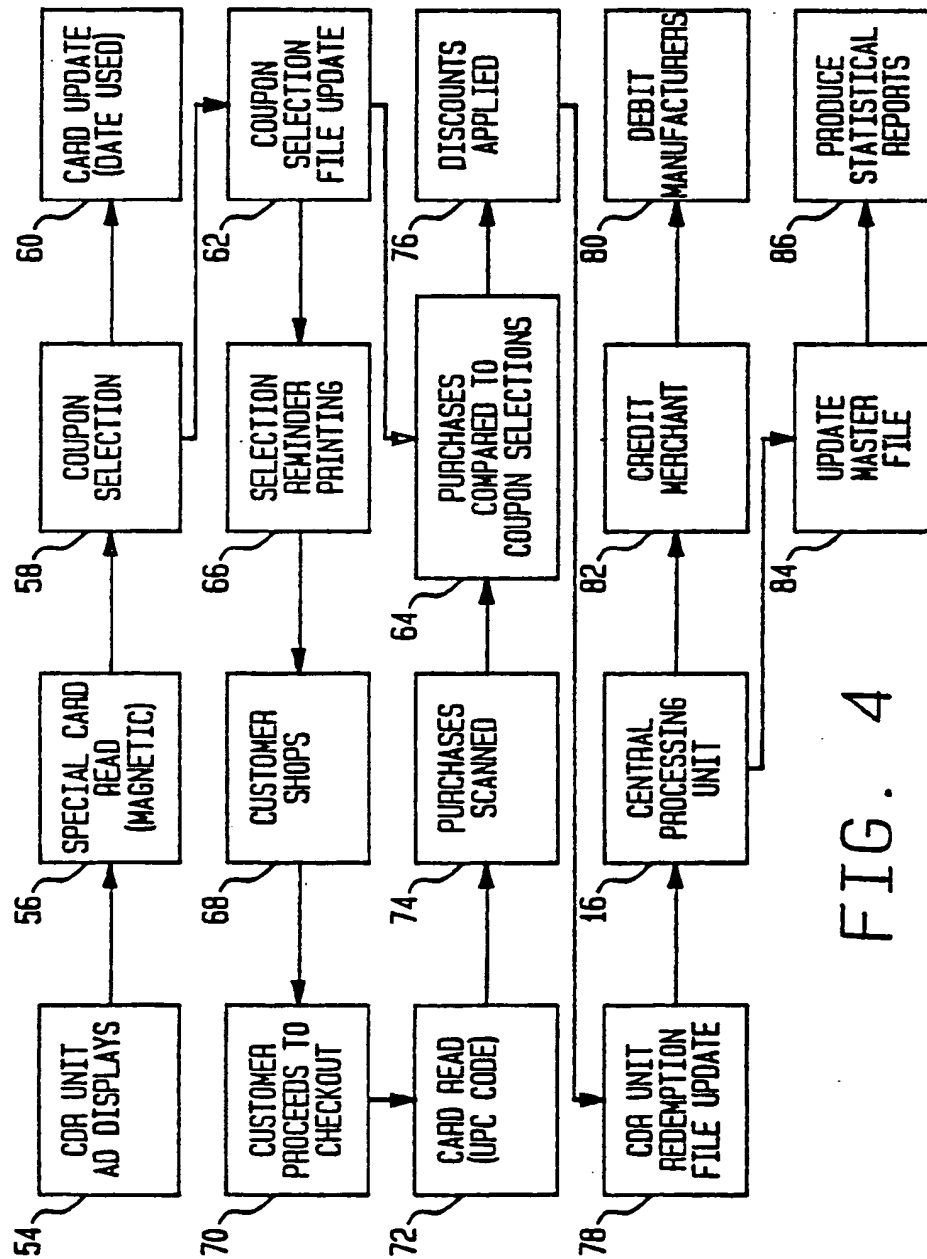


FIG. 3



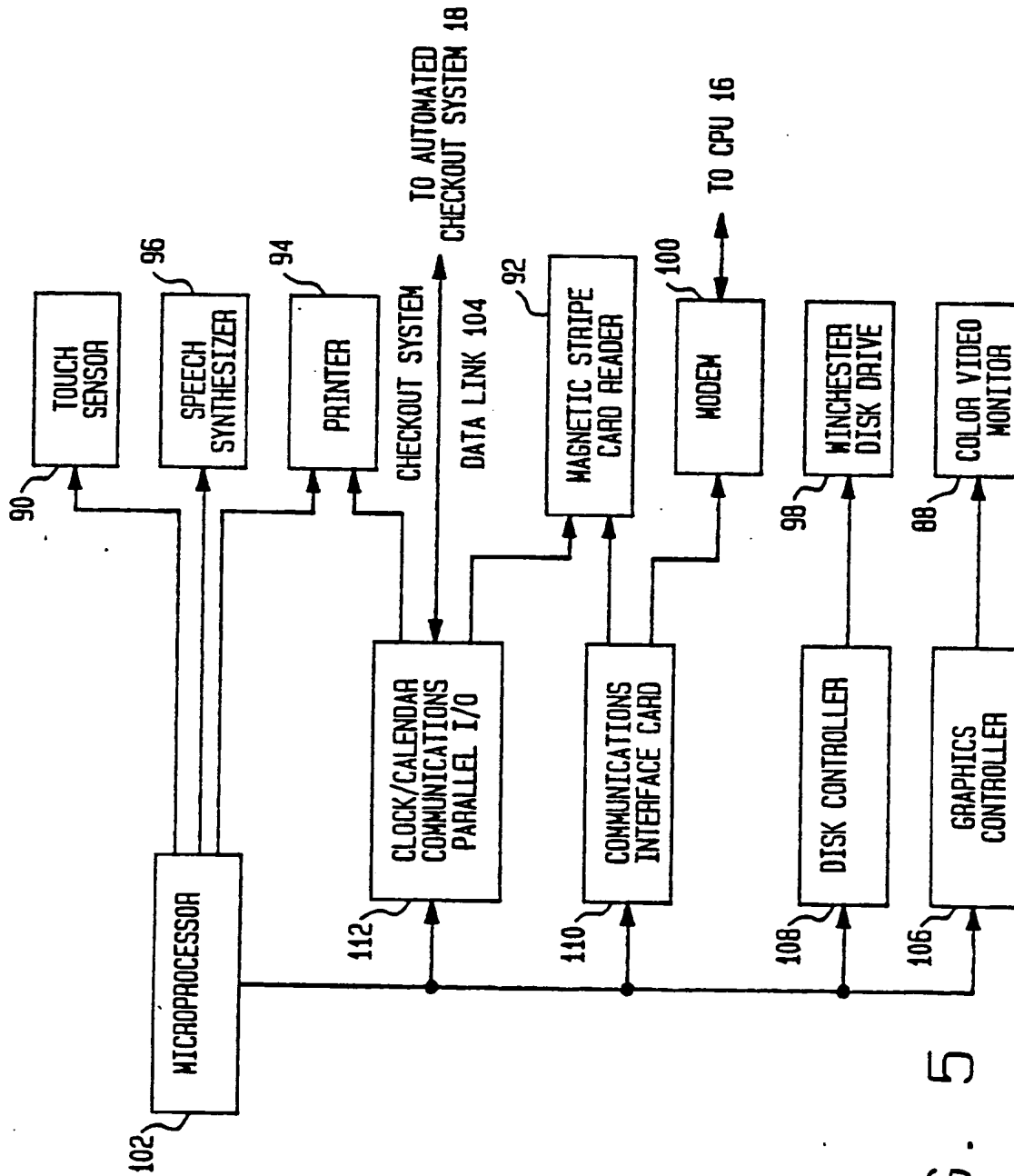


FIG. 5

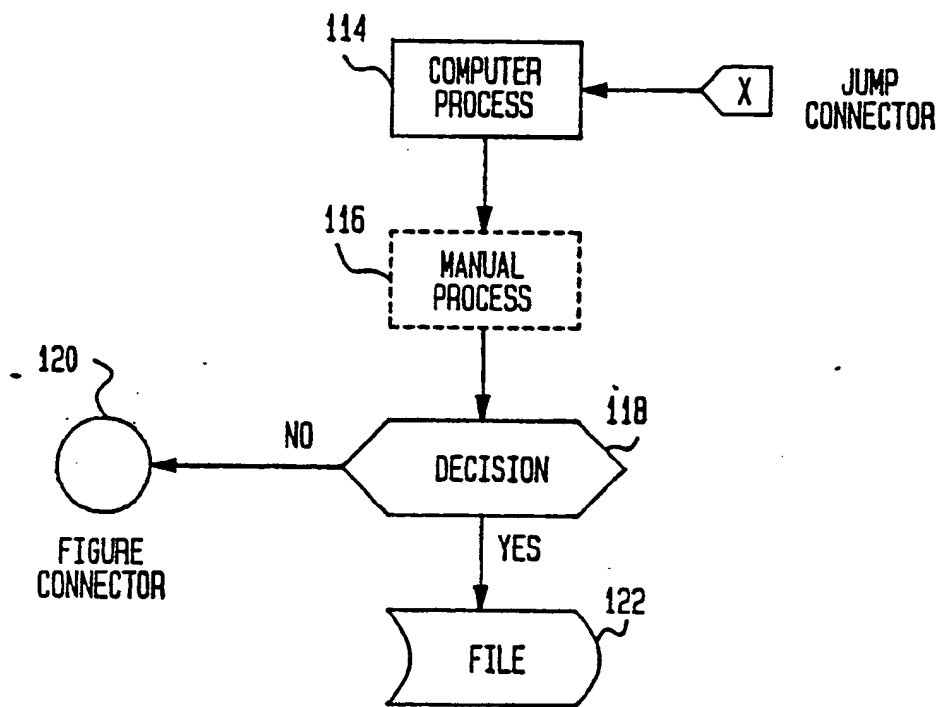


FIG. 6

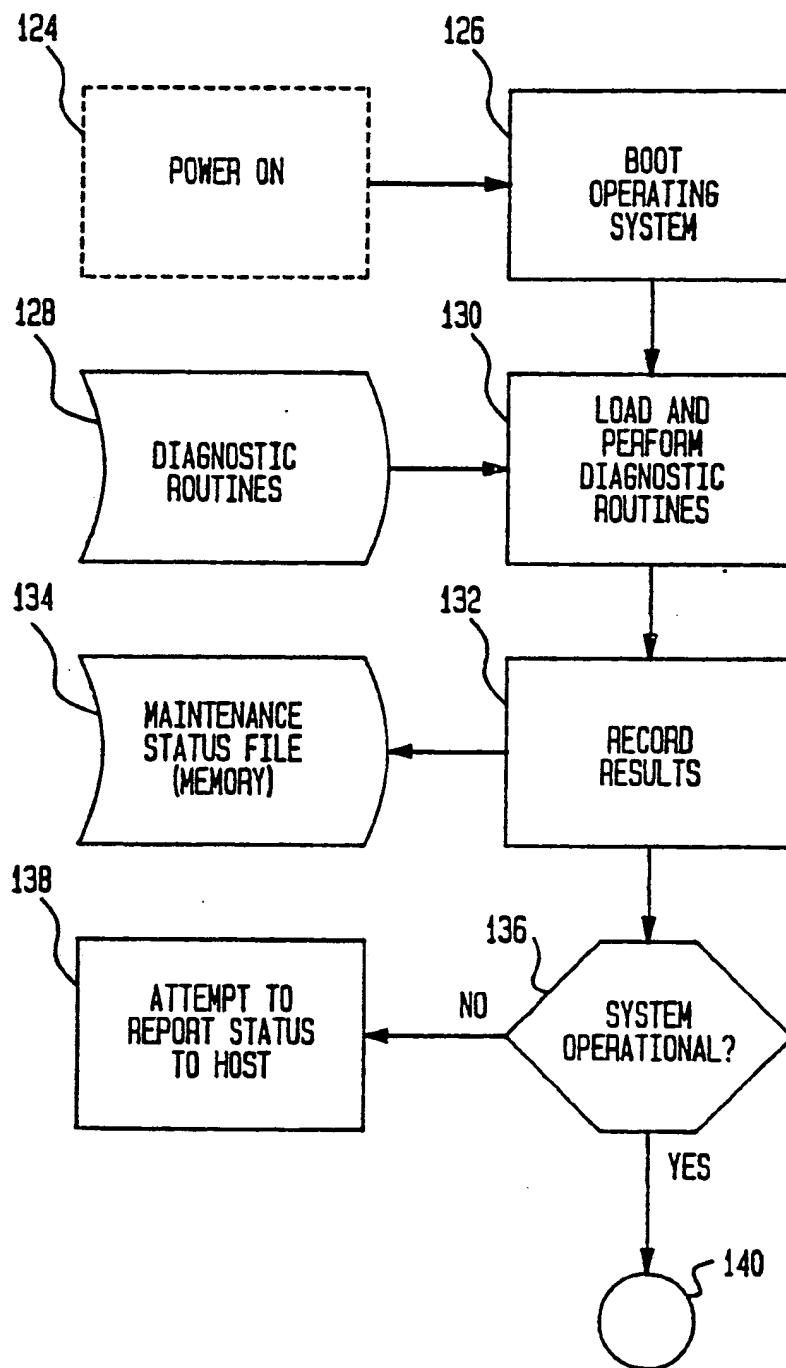


FIG. 7

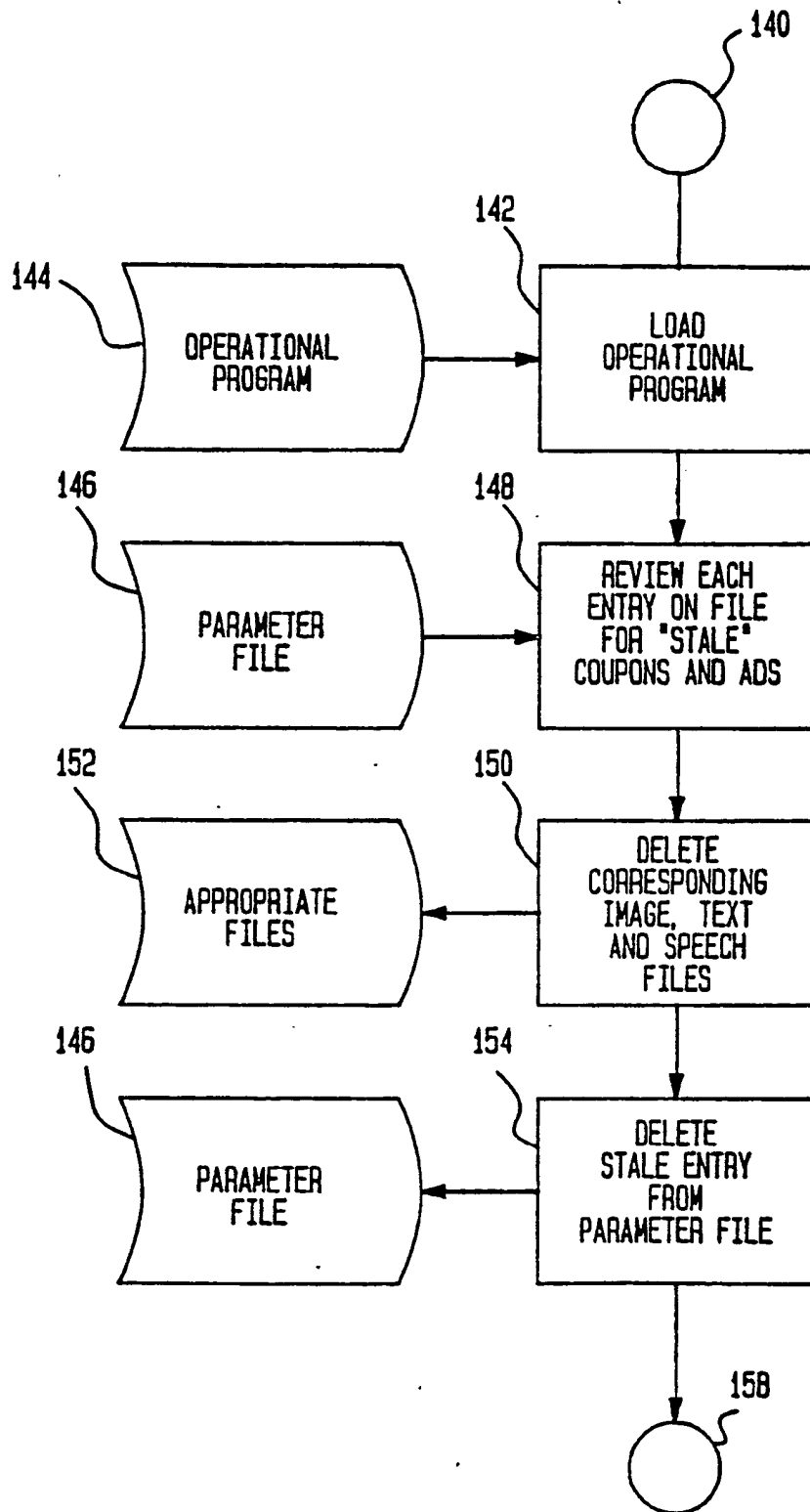


FIG. 8

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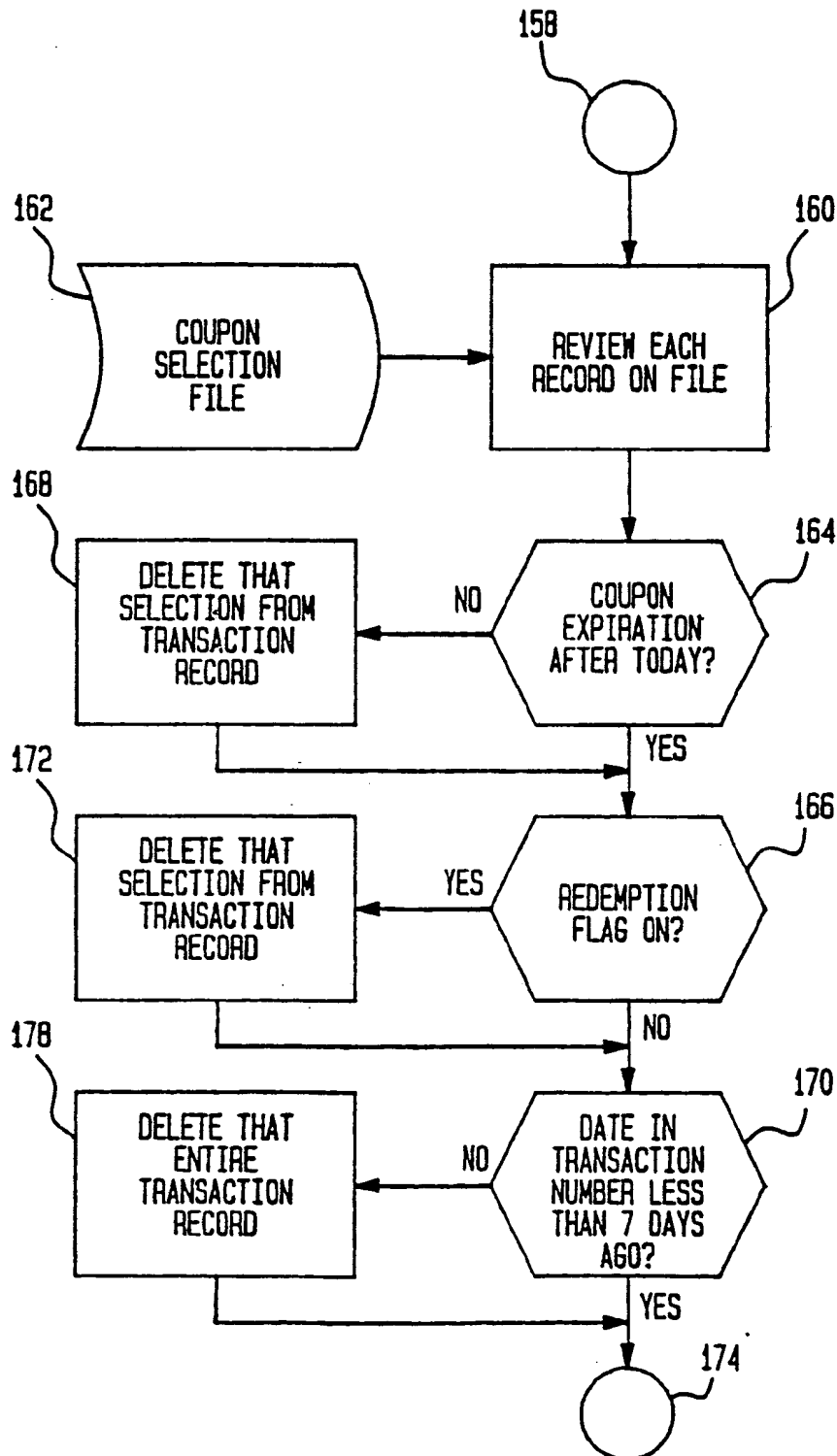


FIG. 9

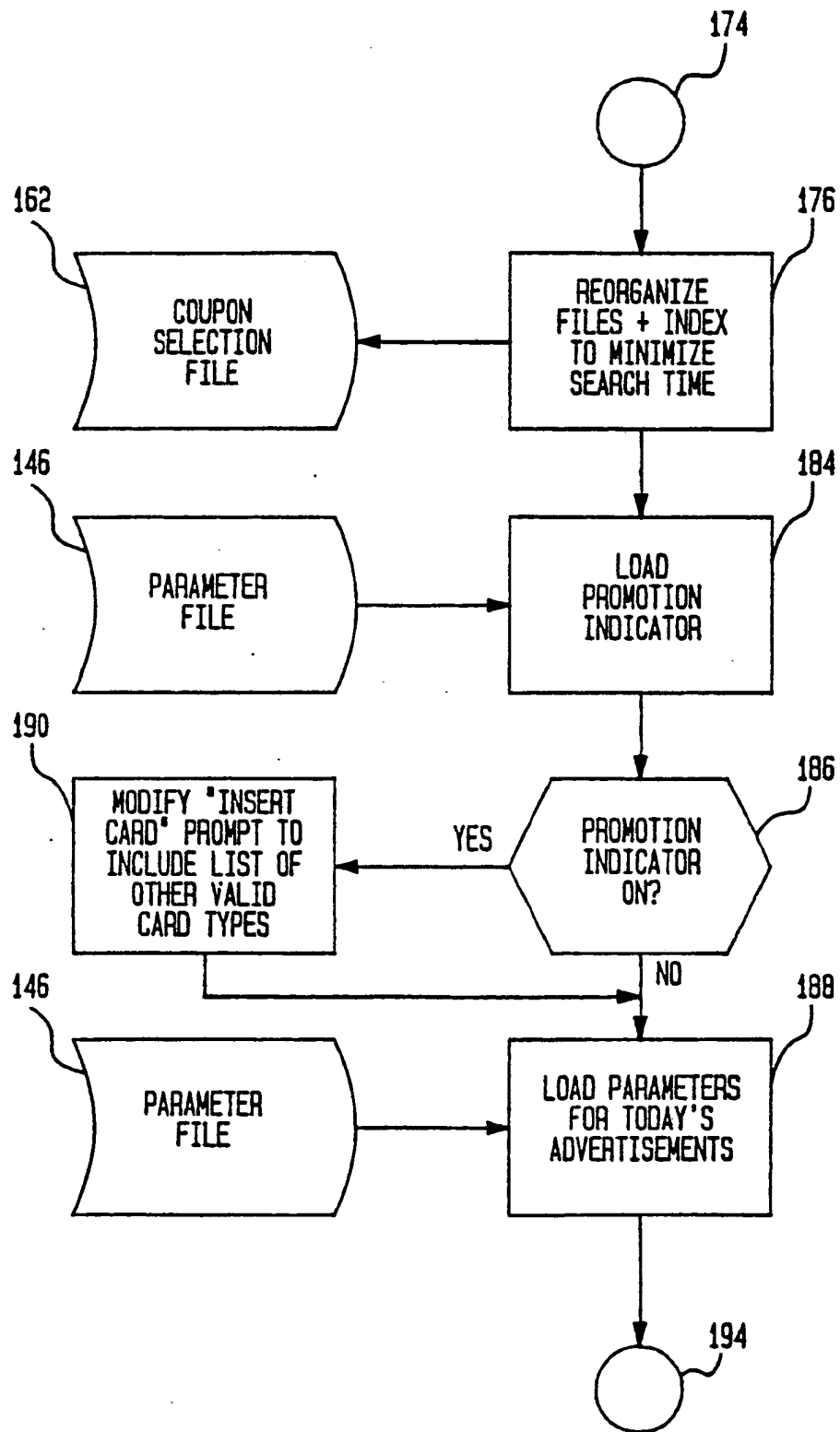


FIG. 10



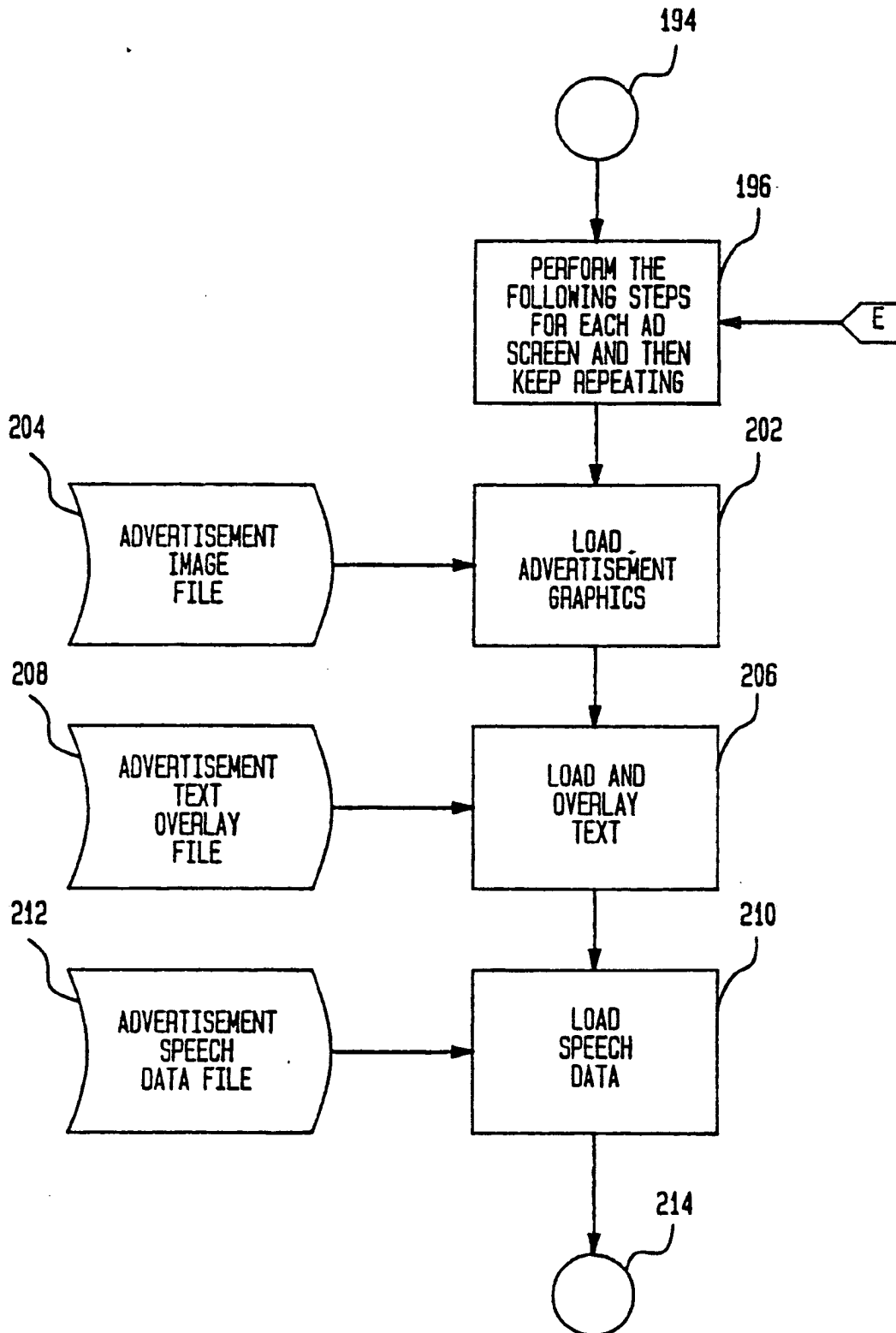


FIG. 11

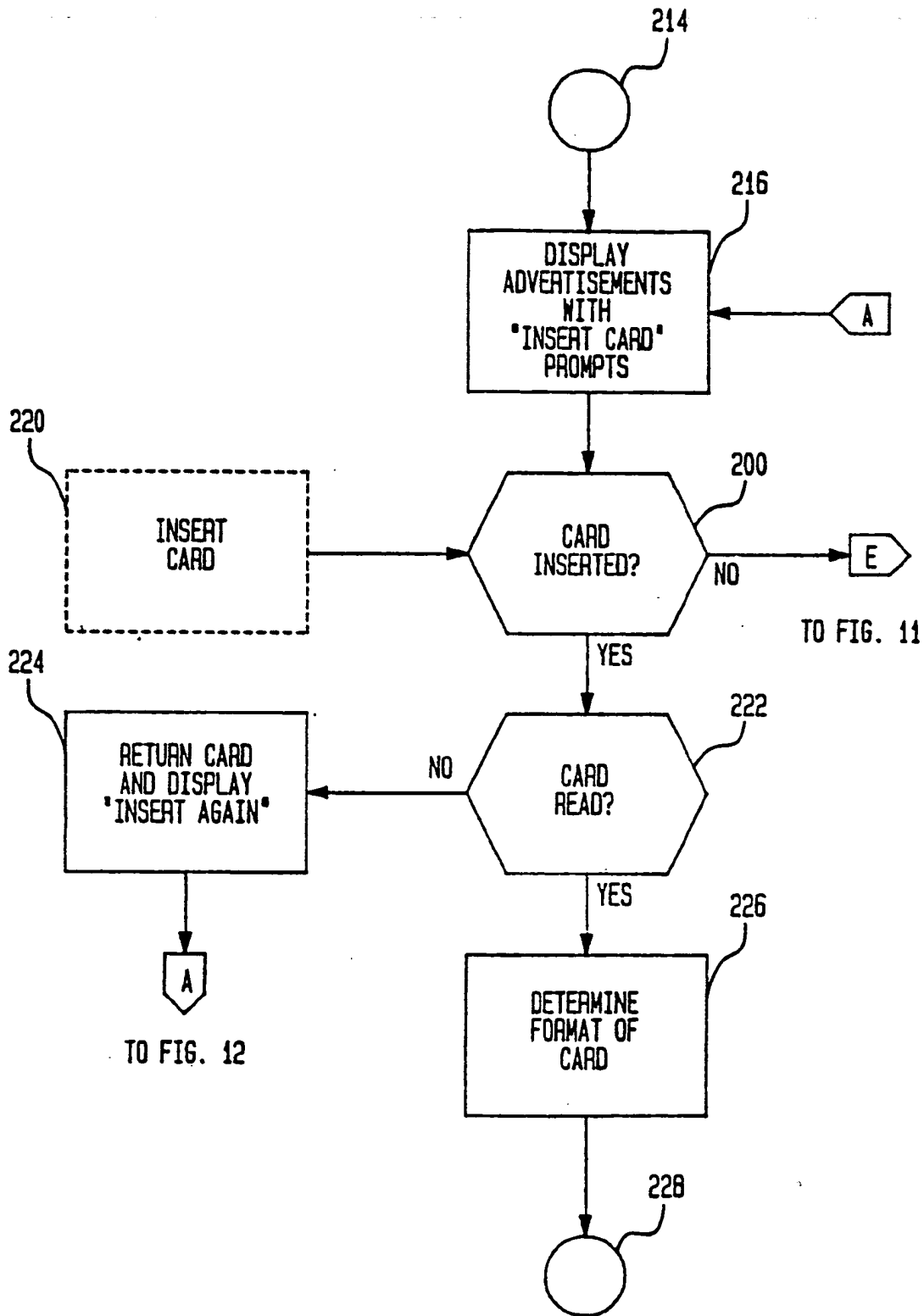


FIG. 12

13/39

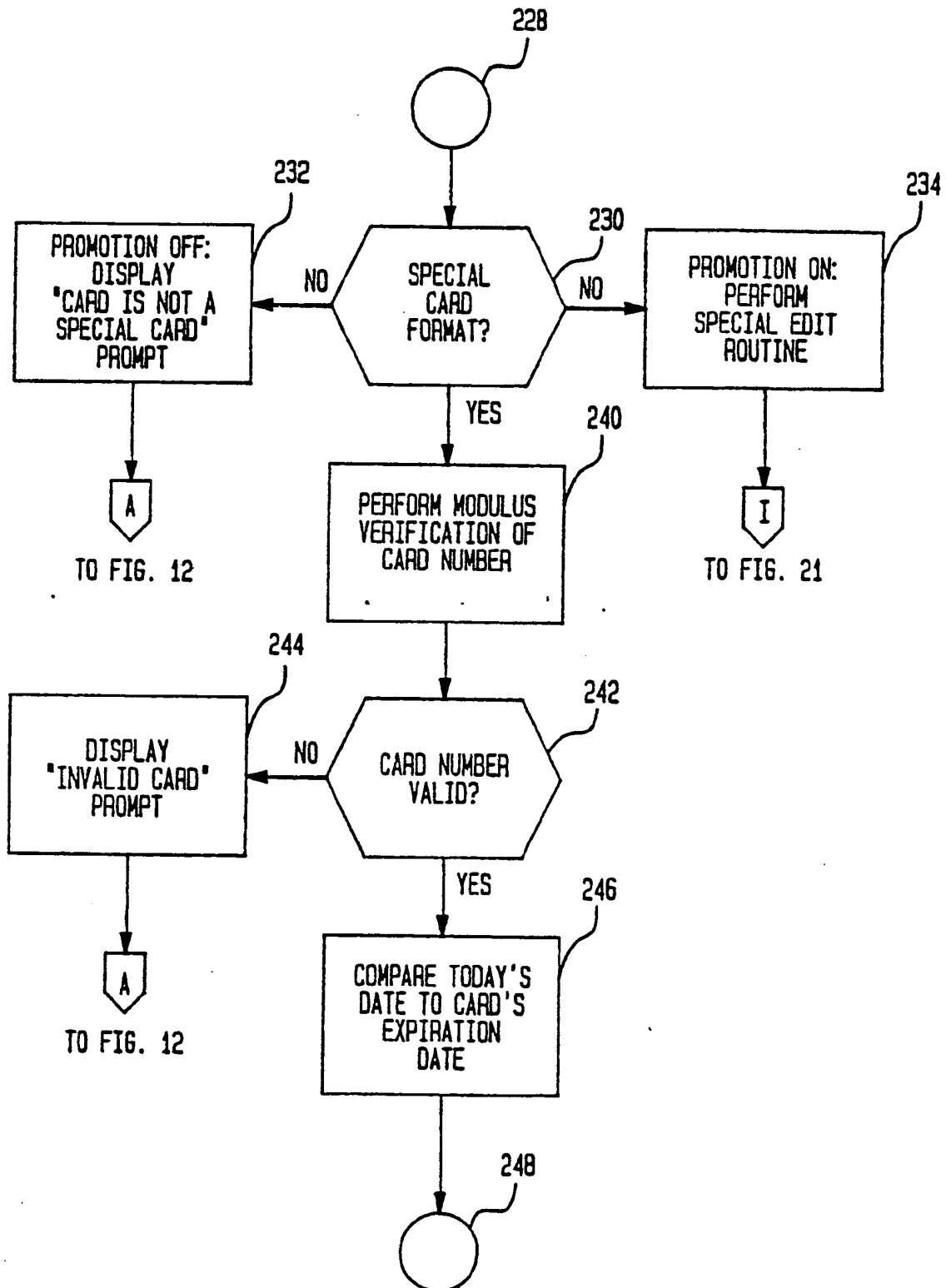


FIG. 13

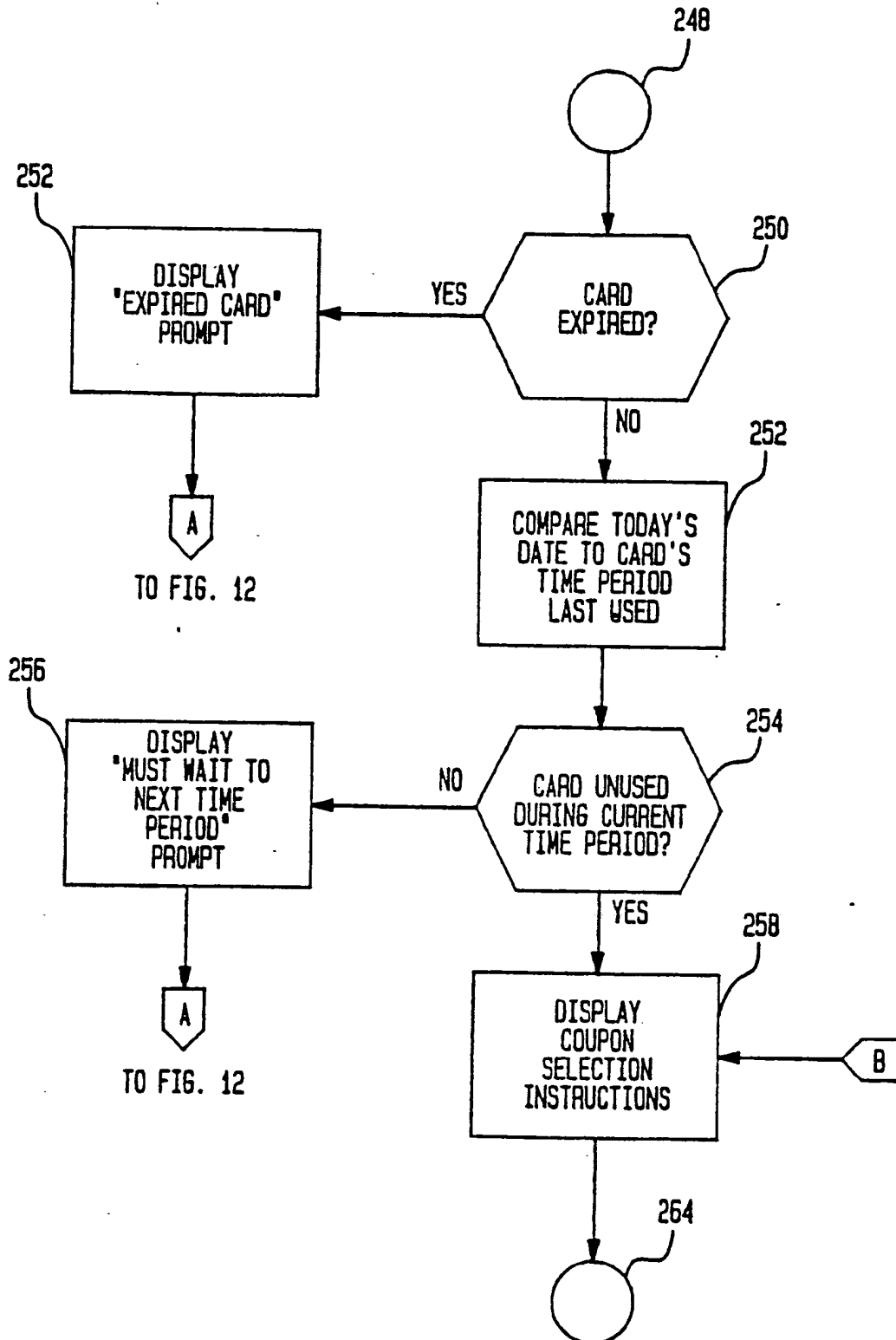


FIG. 14

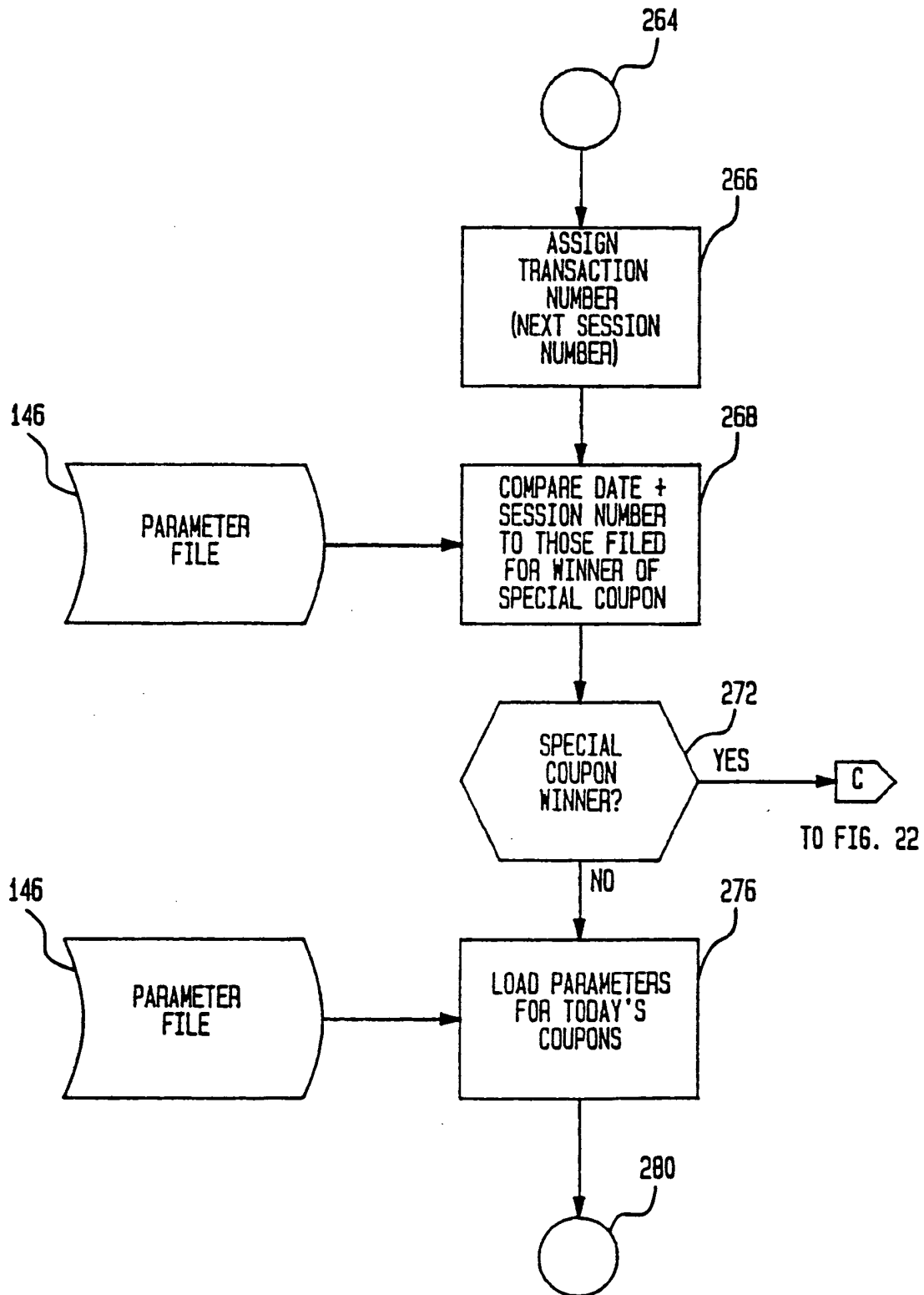


FIG. 15

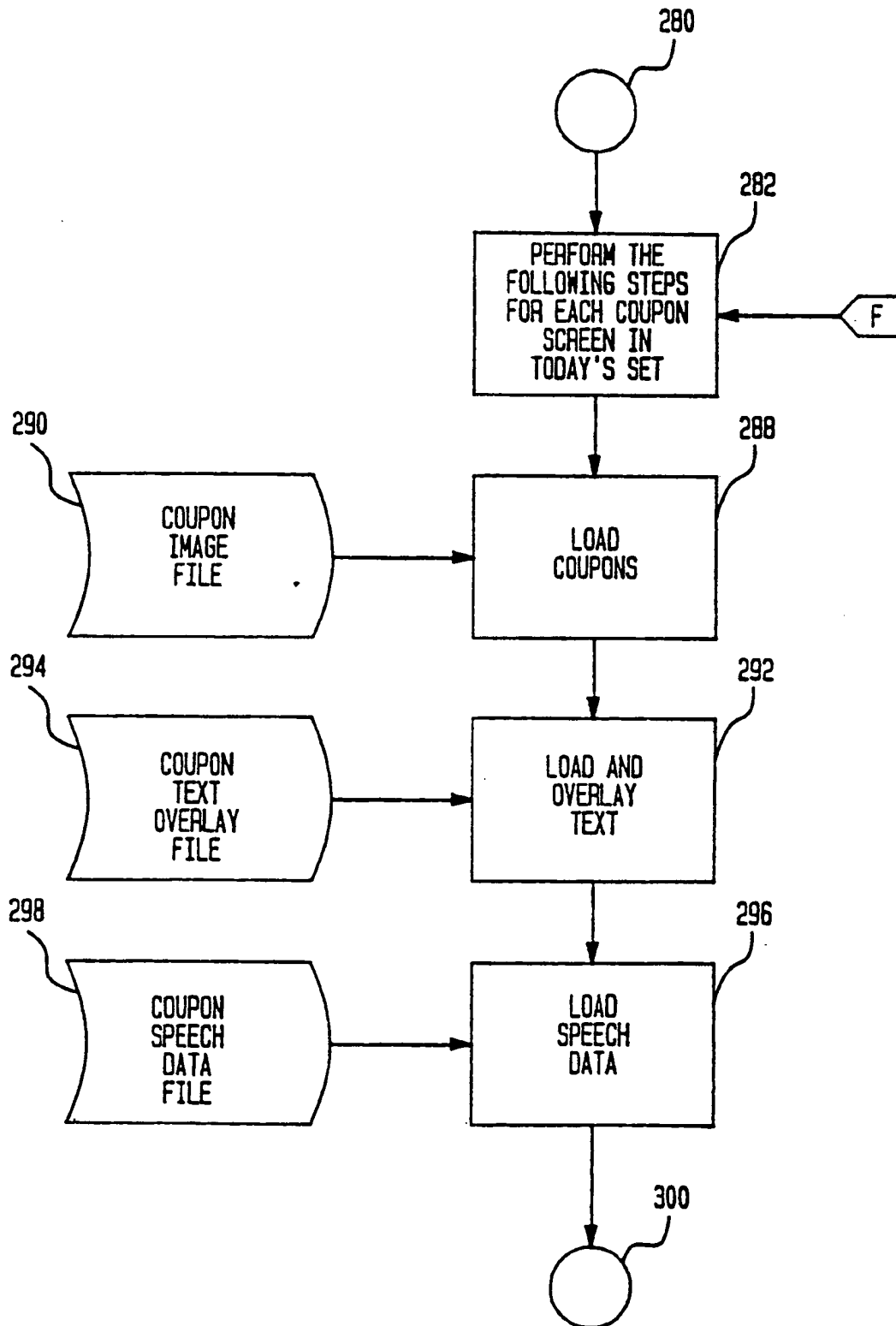


FIG. 16

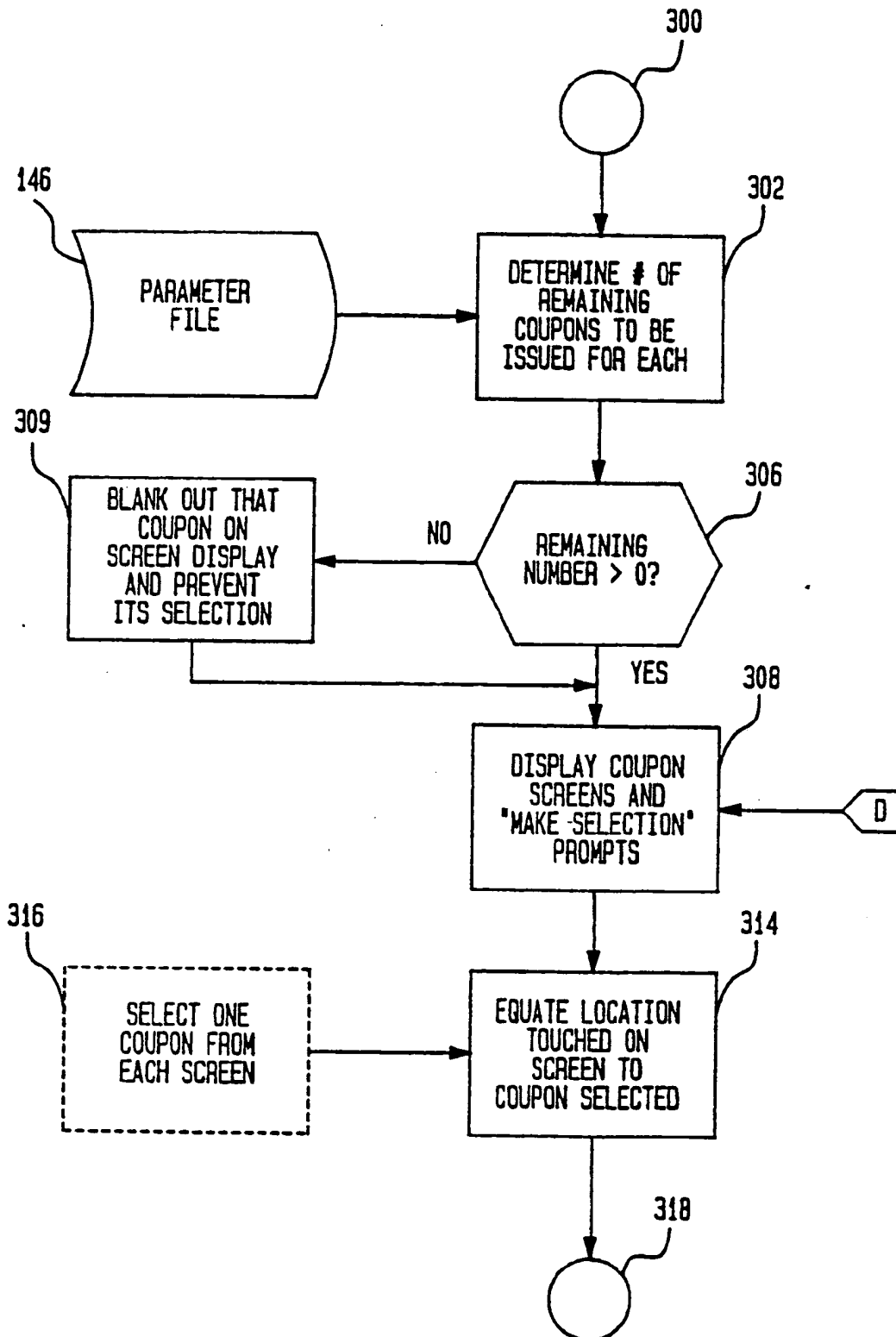


FIG. 17

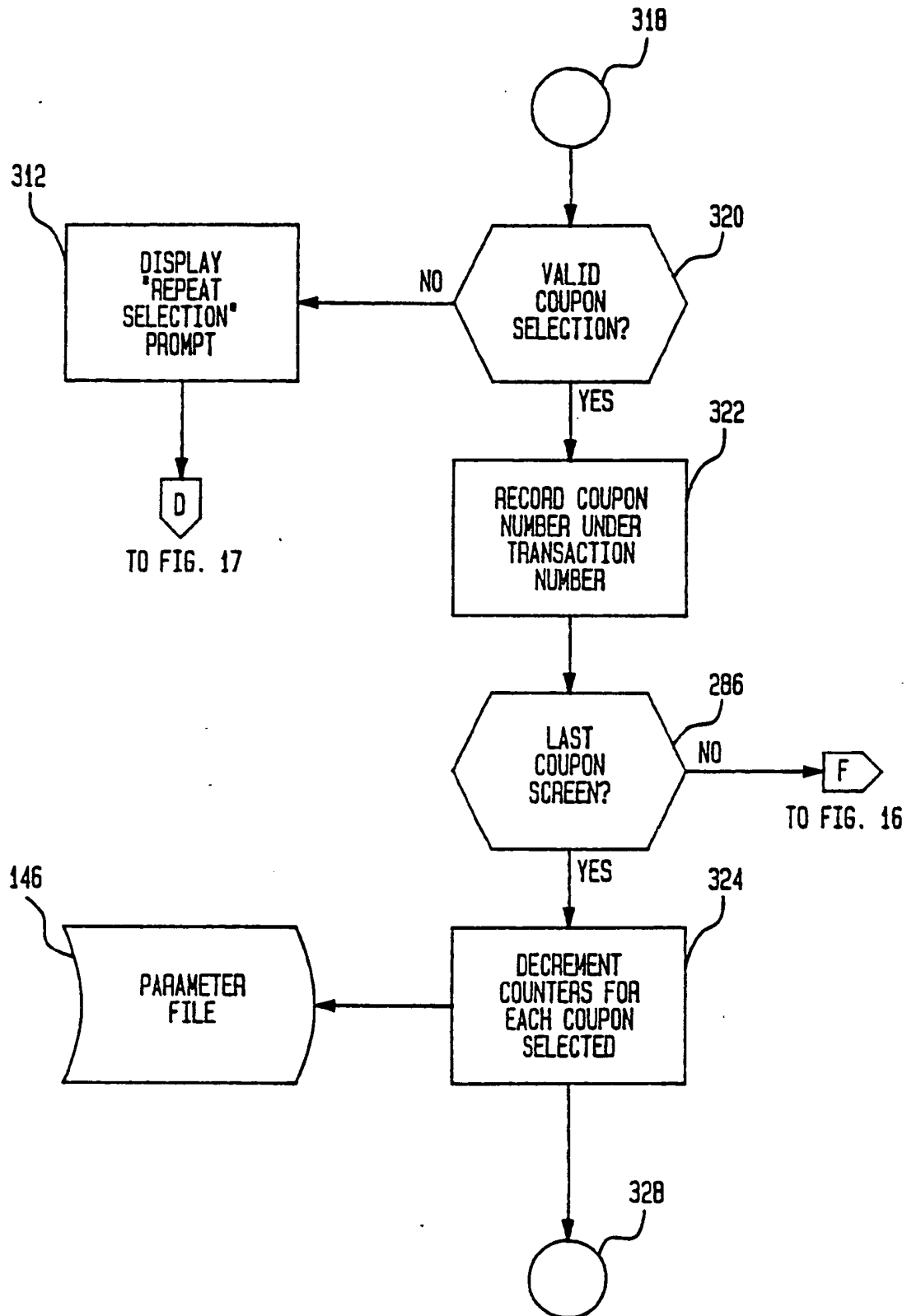


FIG. 18



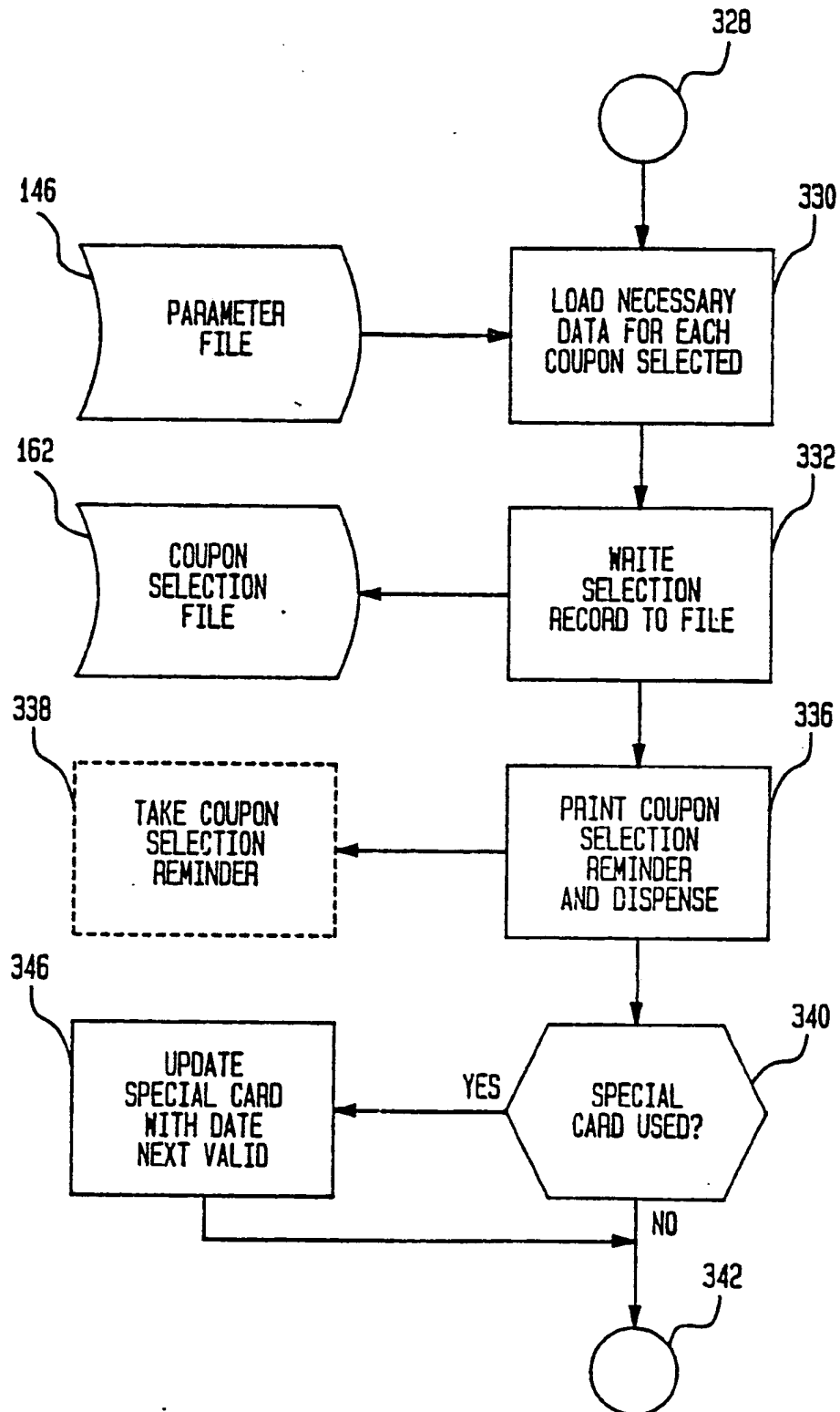


FIG. 19

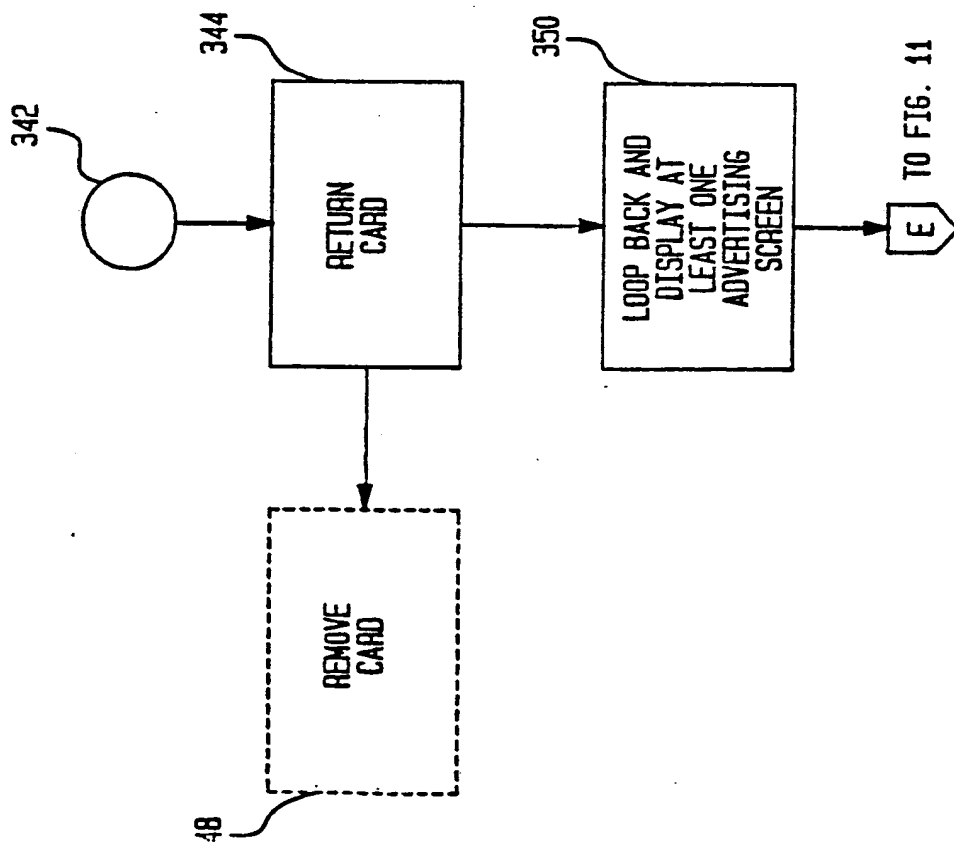


FIG. 20

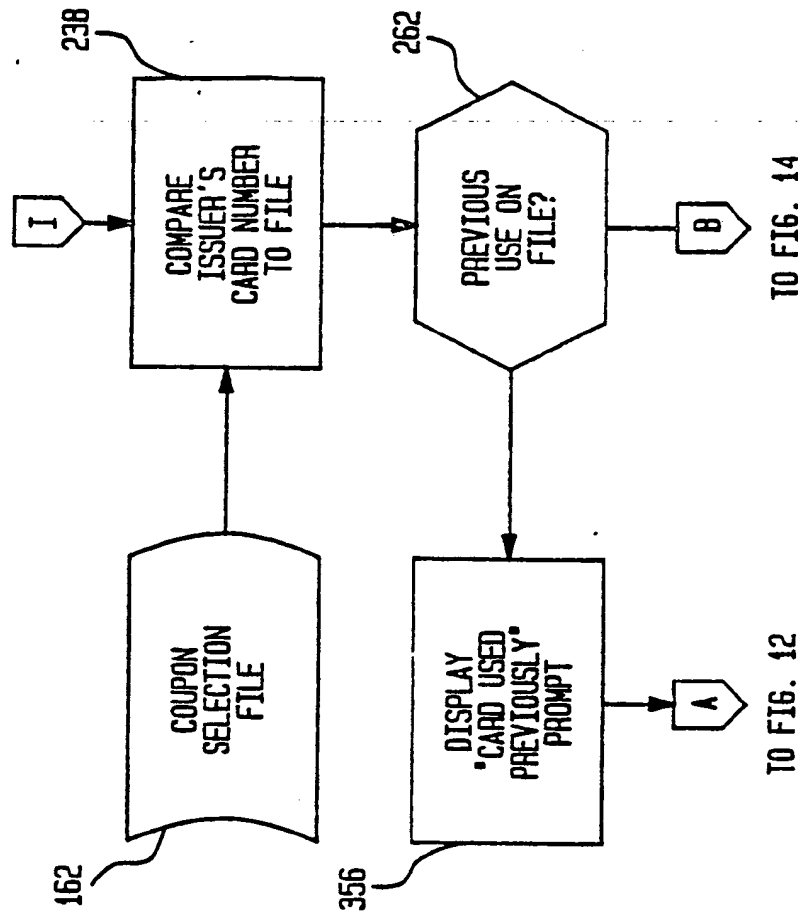


FIG. 21

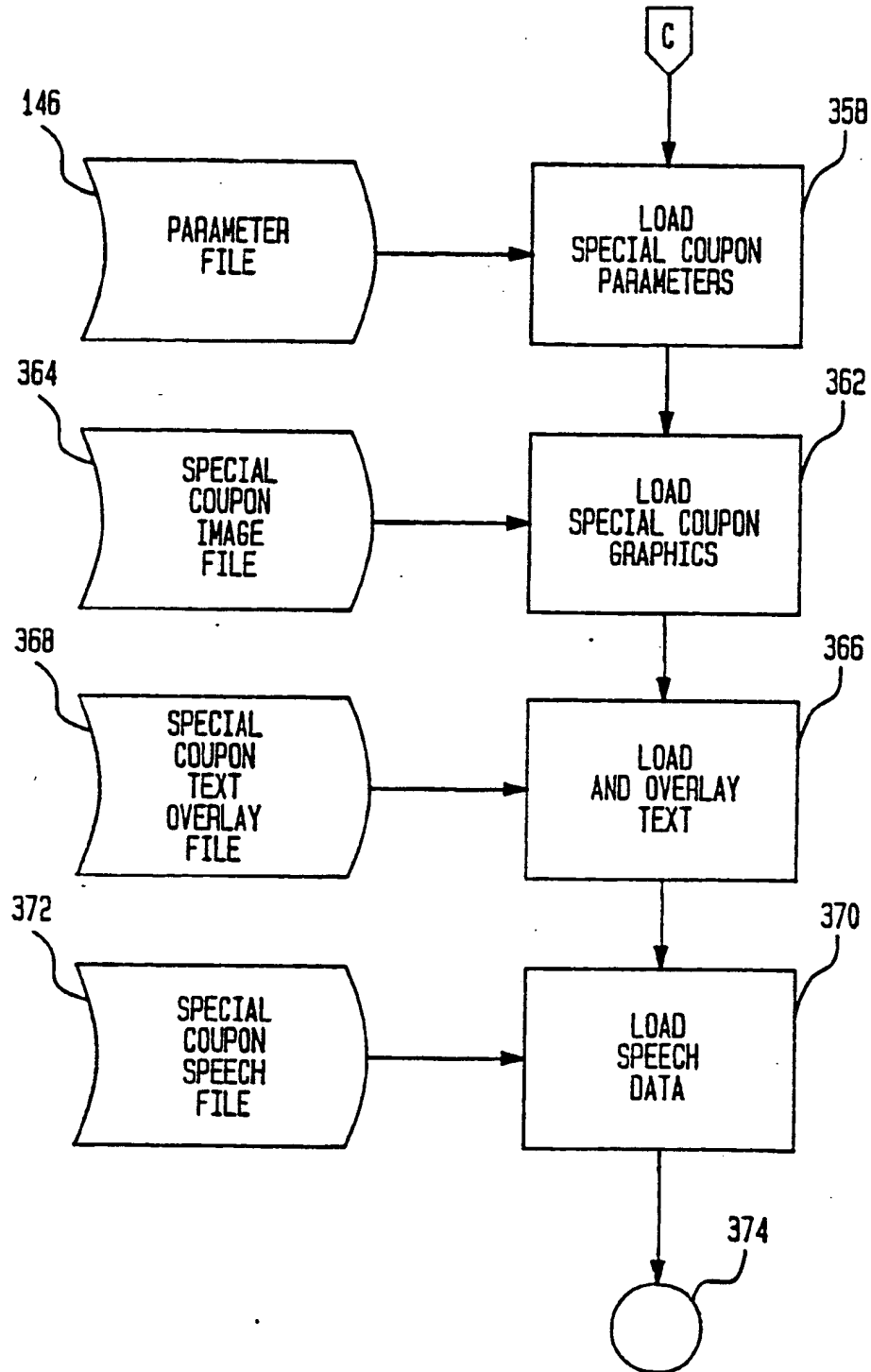


FIG. 22

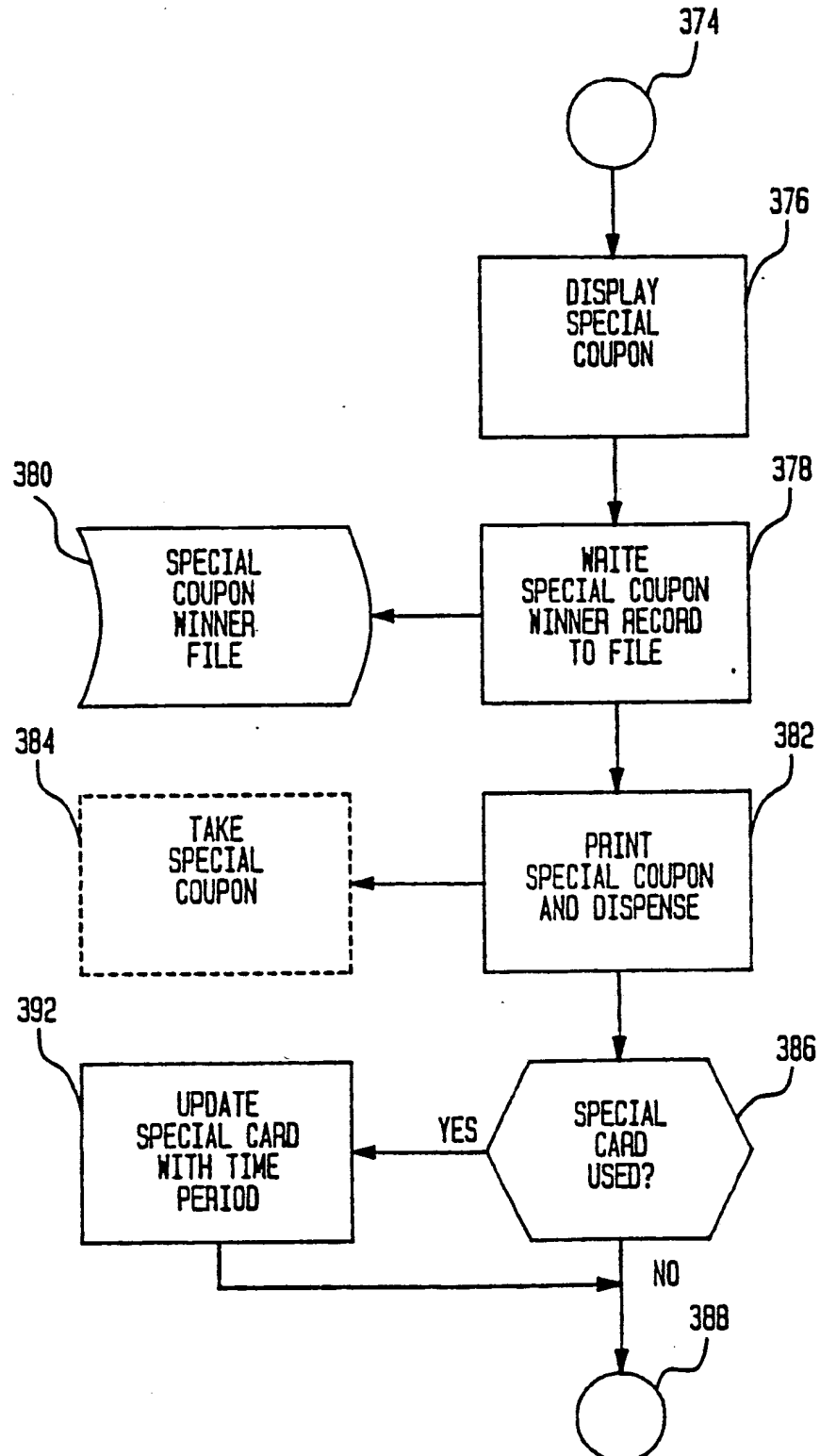


FIG. 23

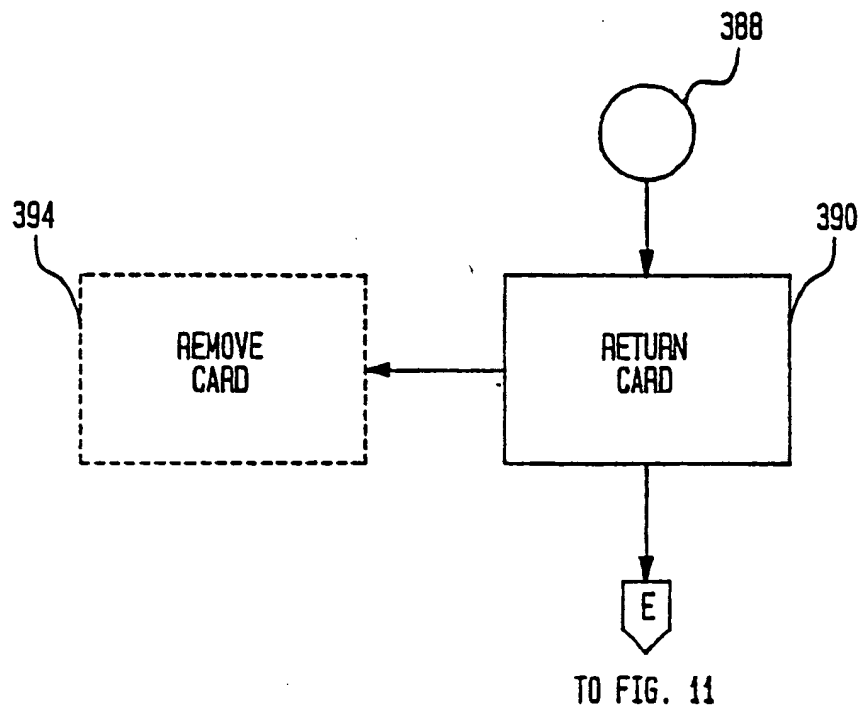


FIG. 24

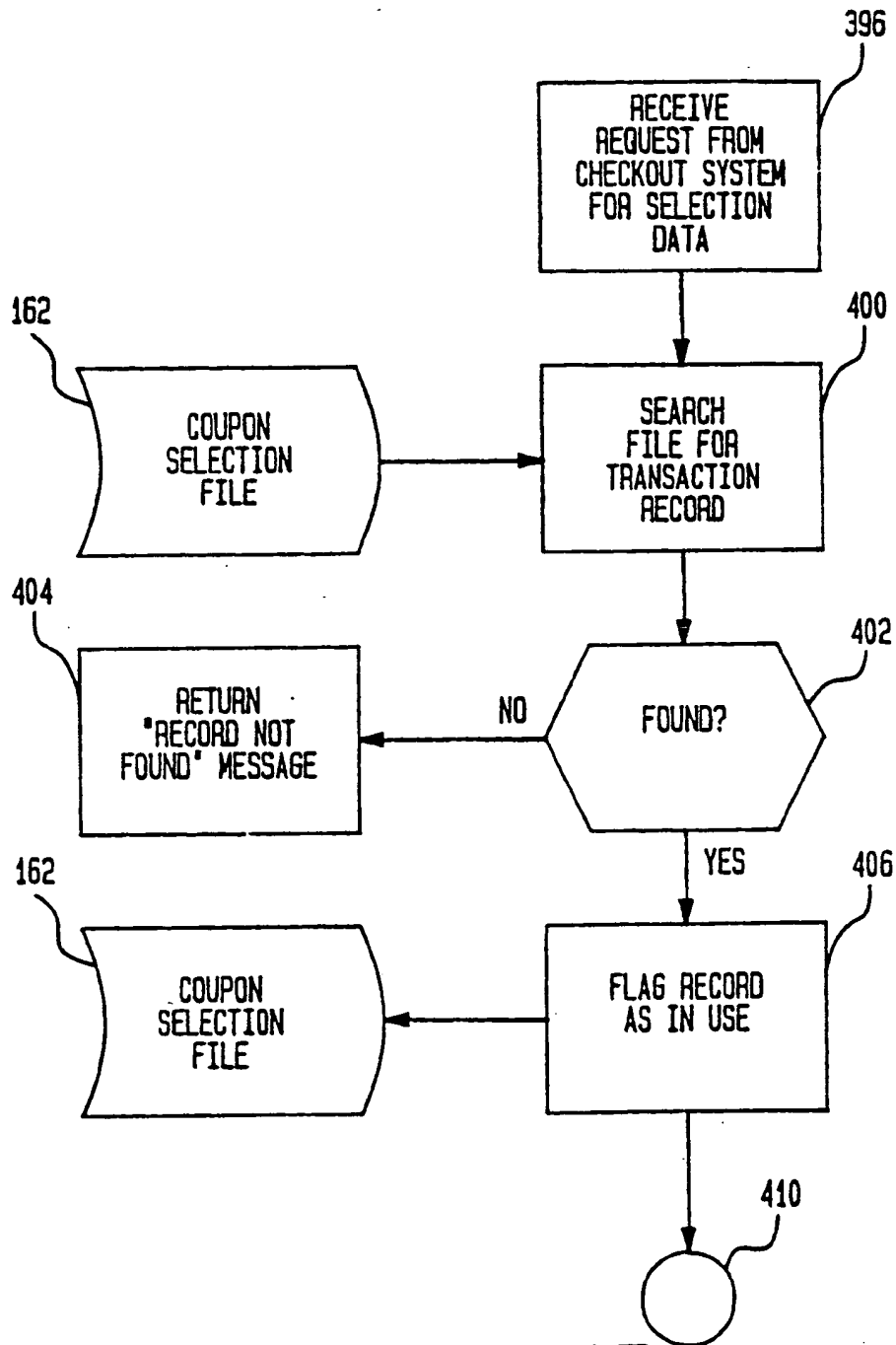


FIG. 25

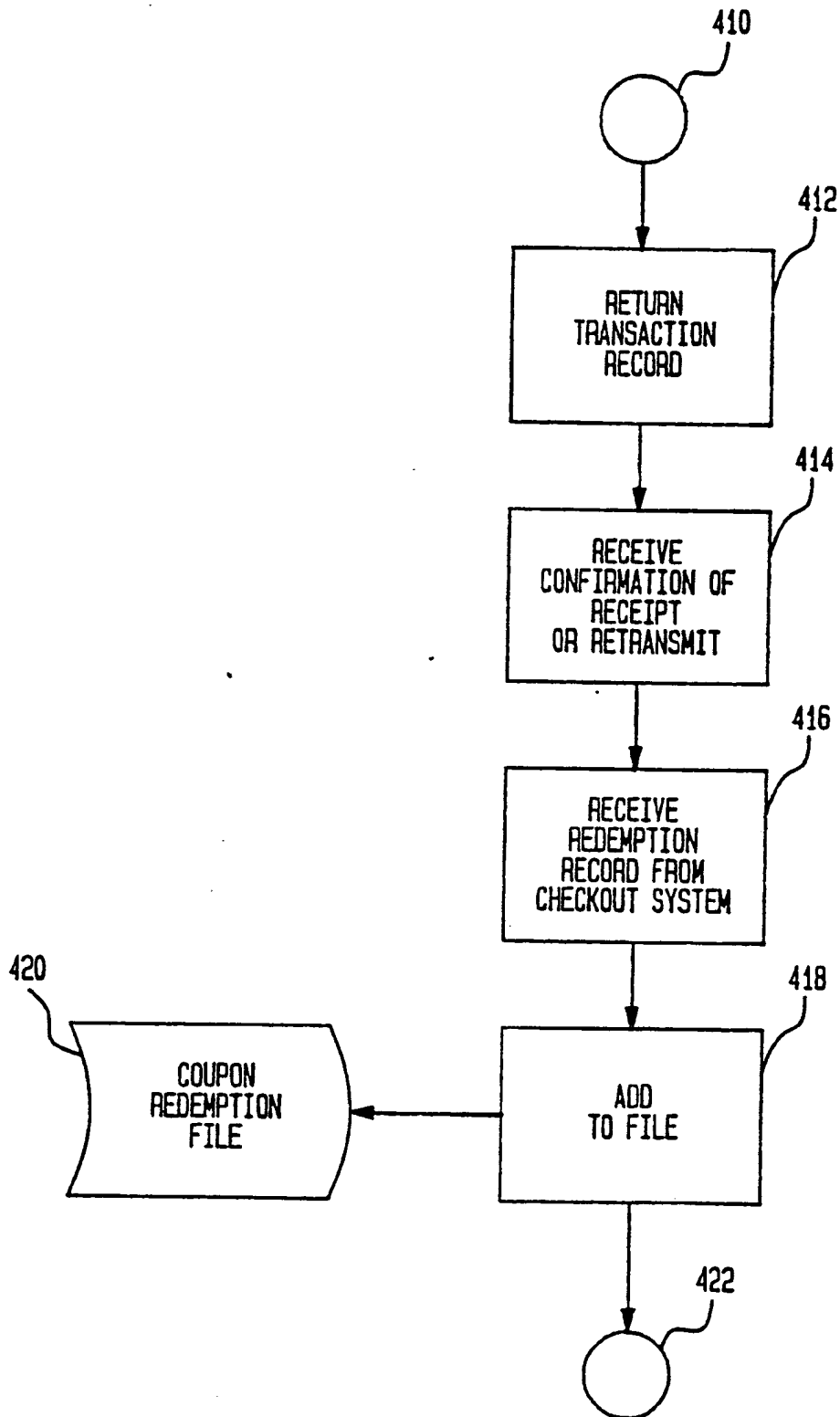


FIG. 26

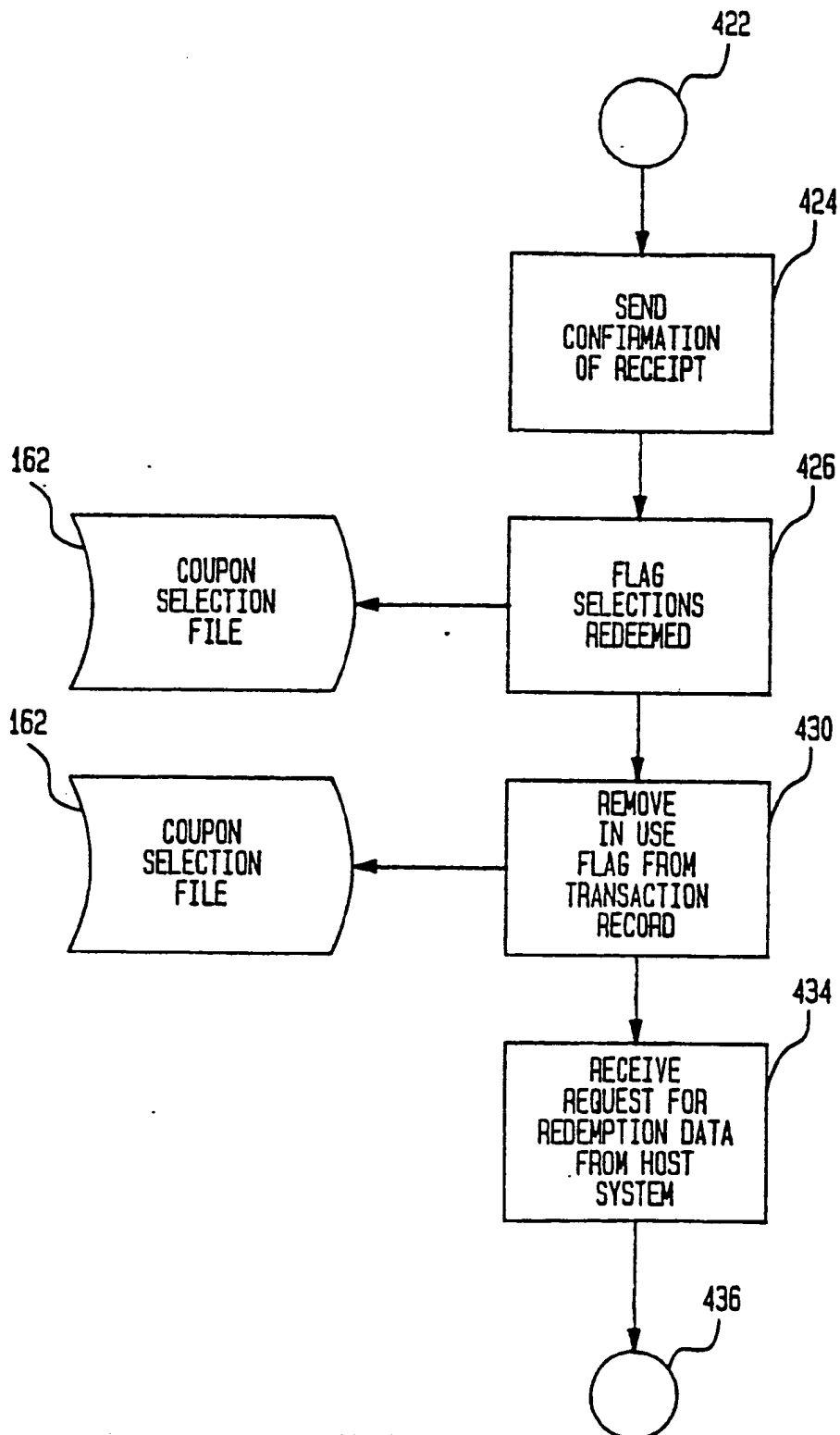


FIG. 27



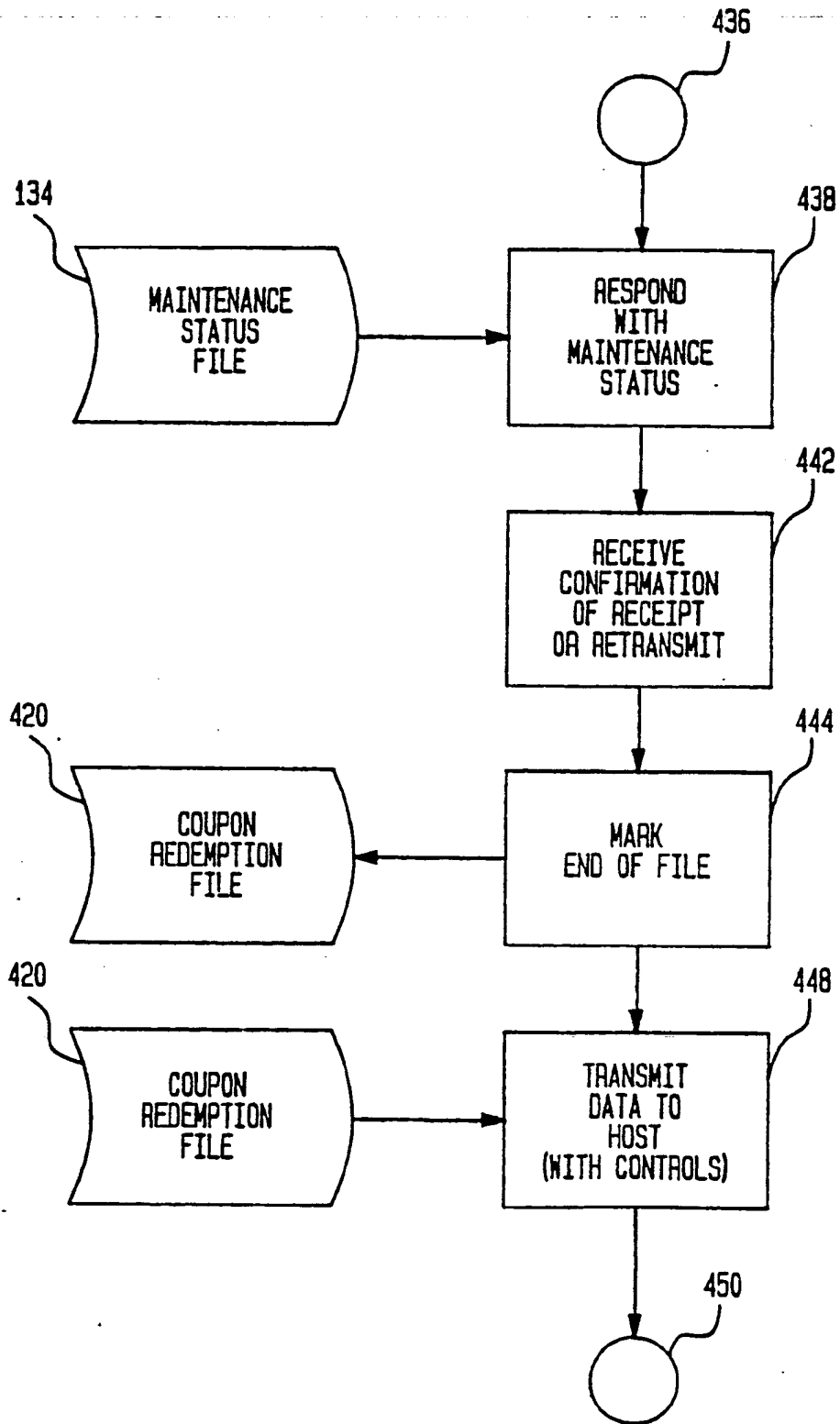


FIG. 28

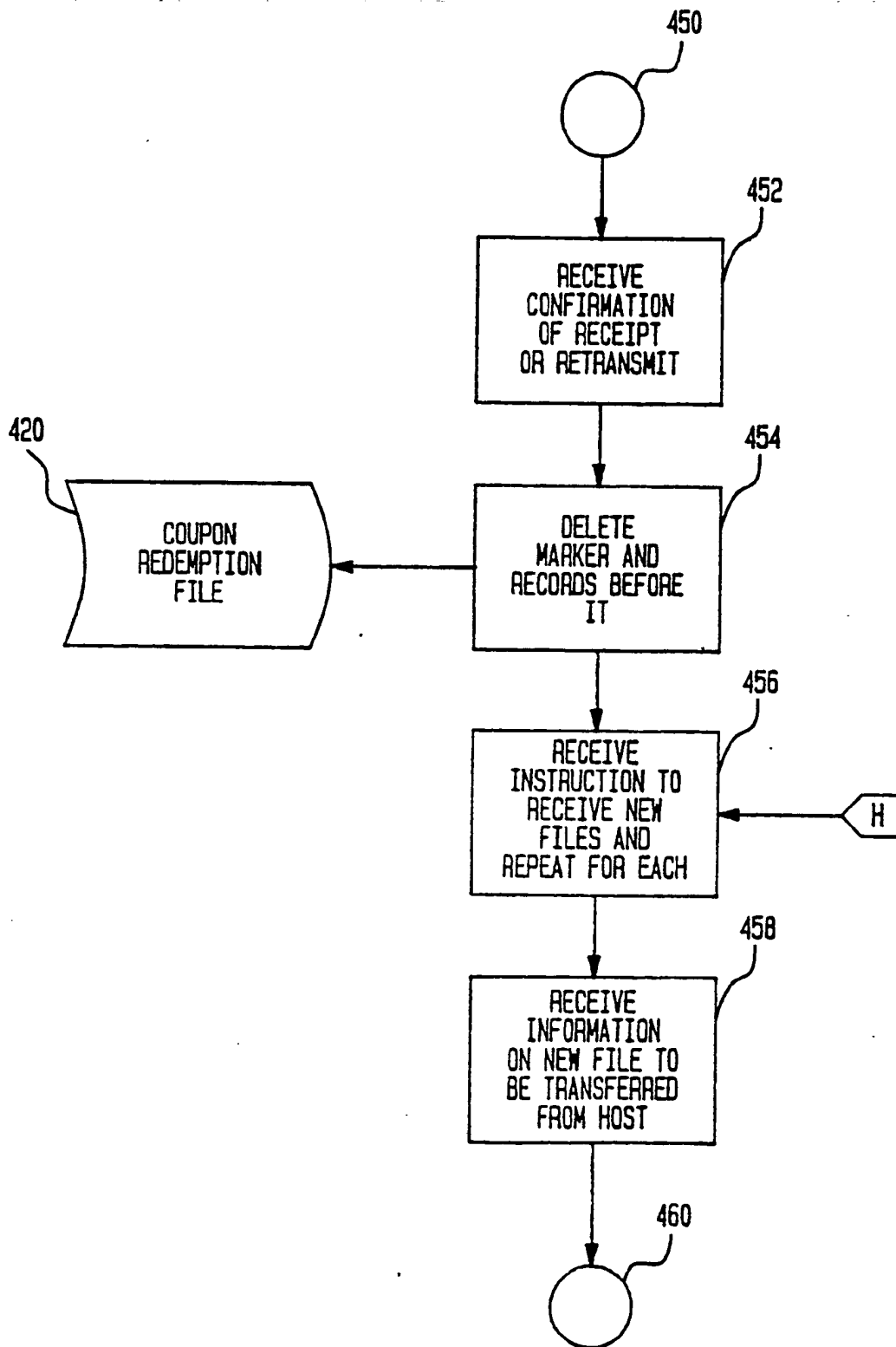


FIG. 29

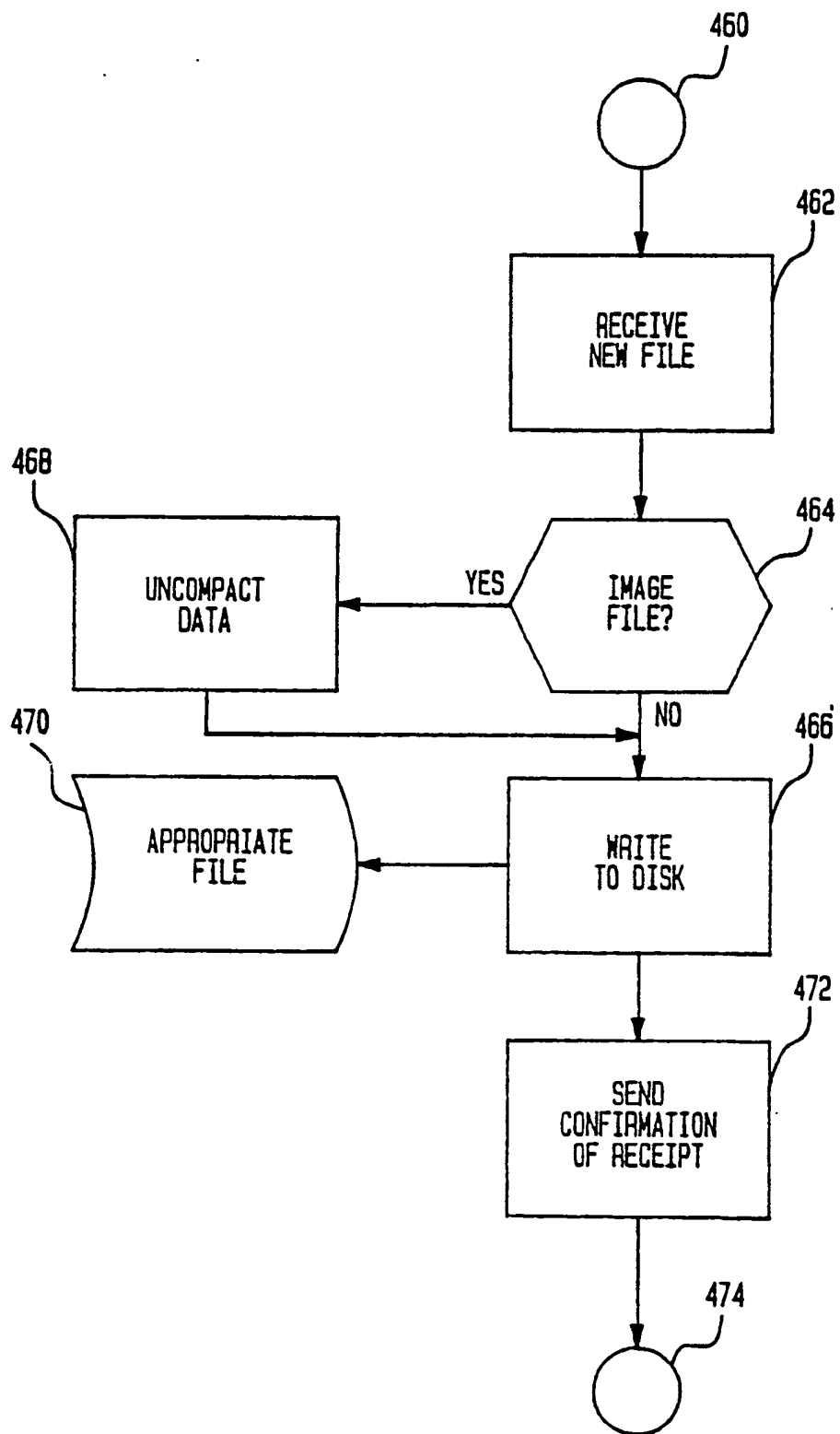


FIG. 30

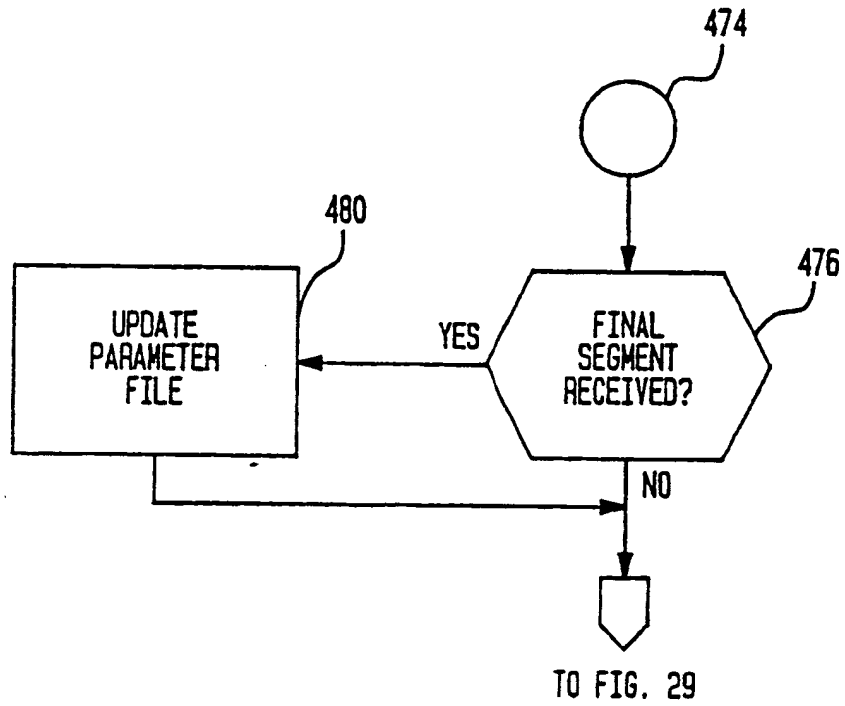


FIG. 31

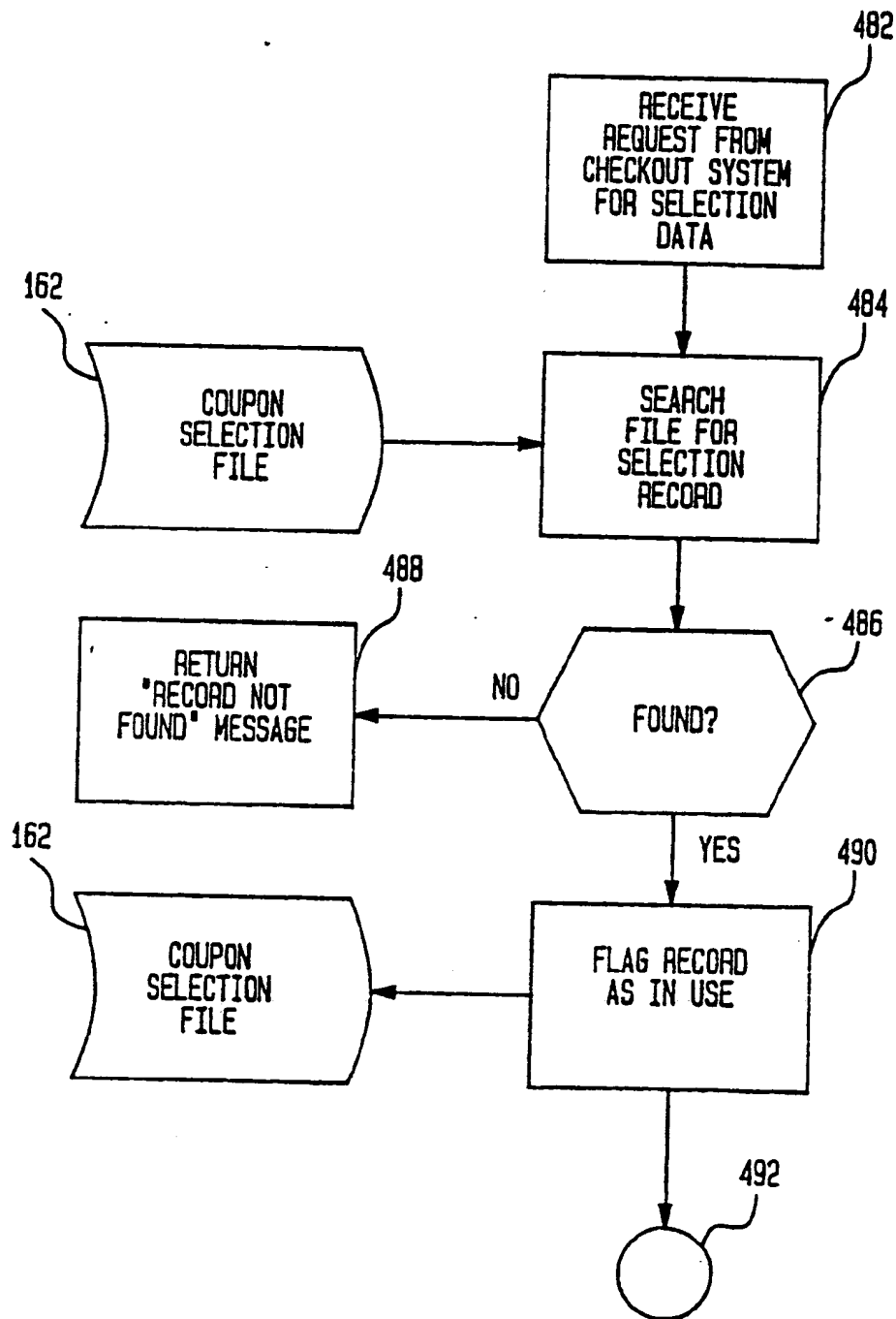


FIG. 32

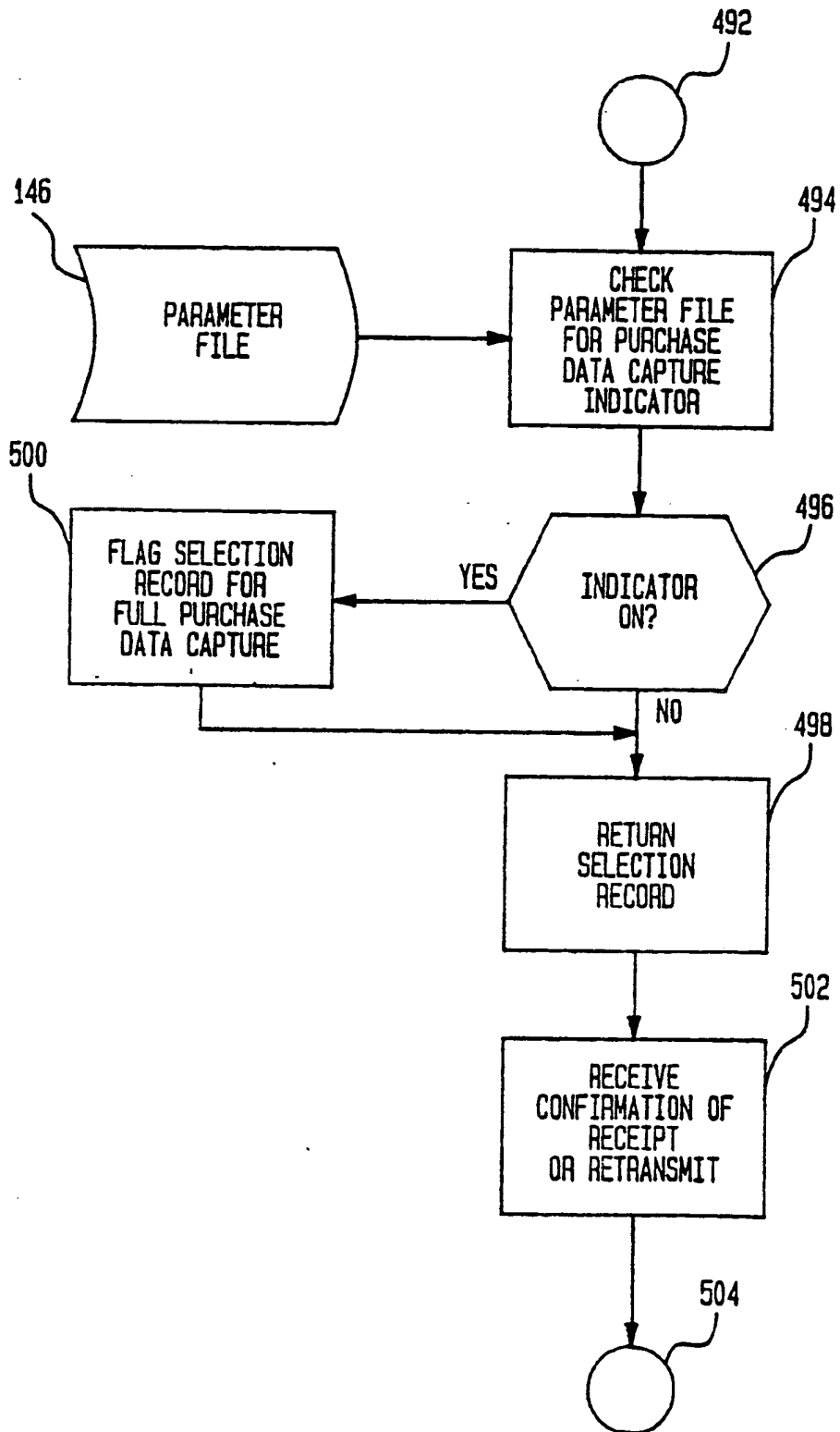


FIG. 33

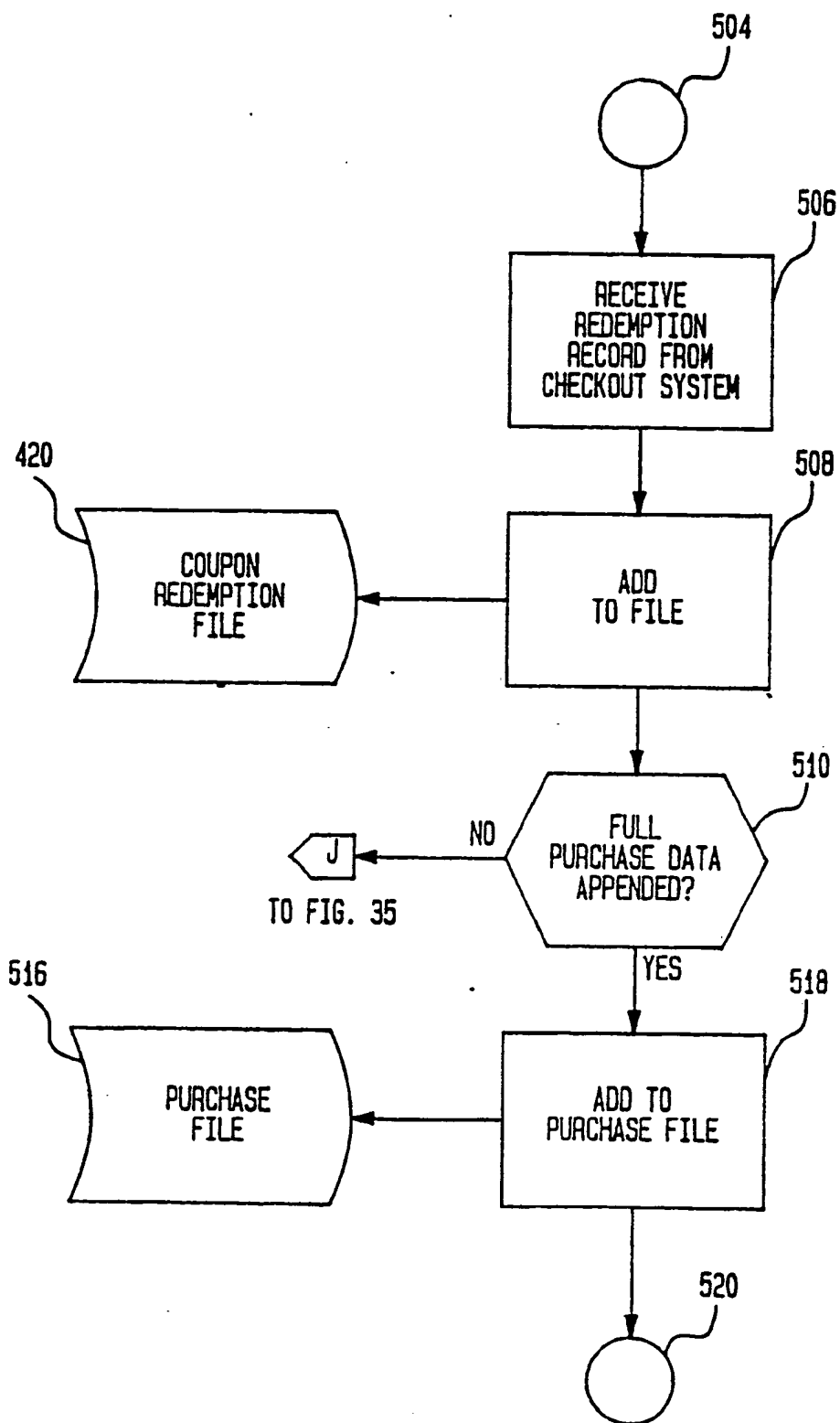


FIG. 34

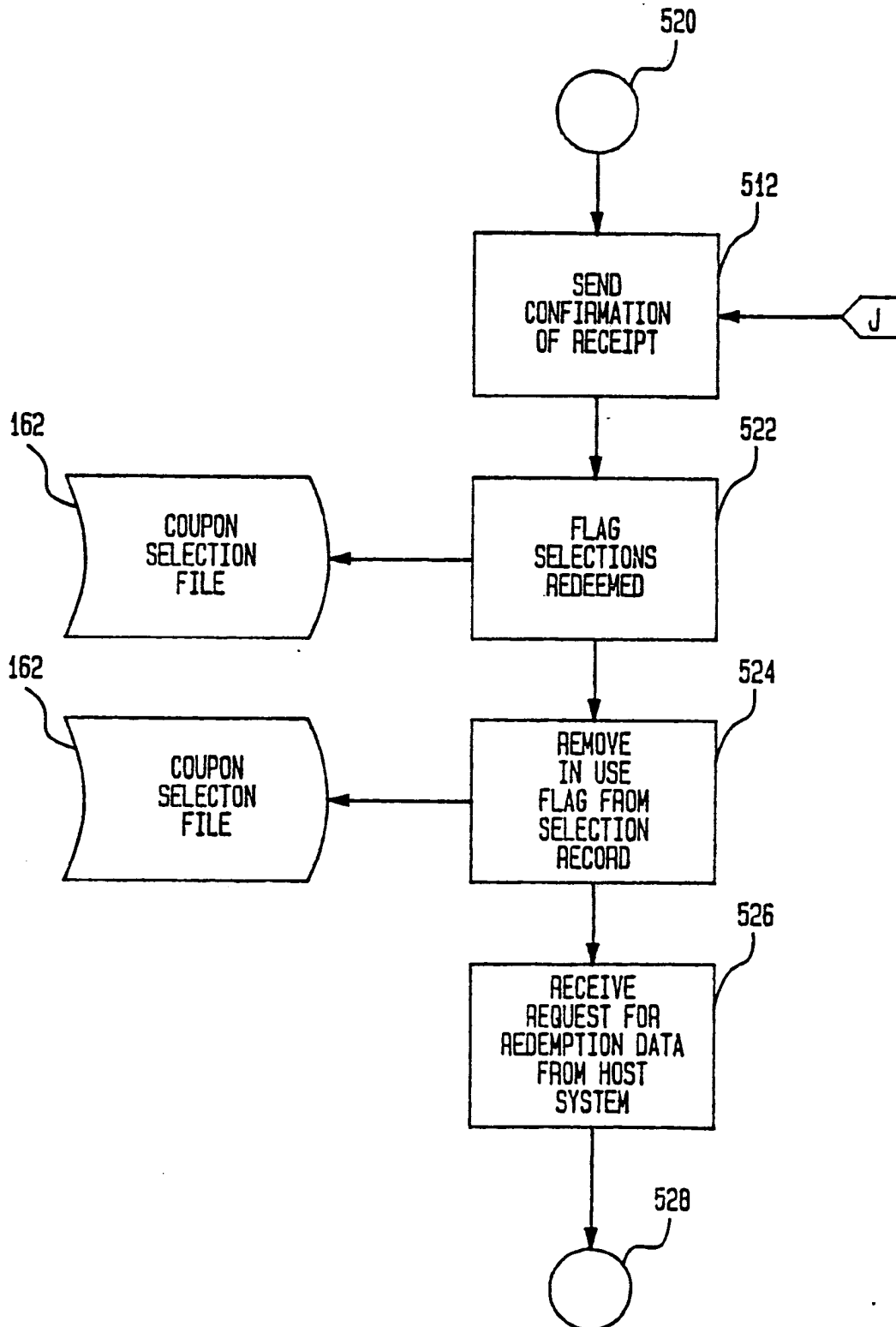


FIG. 35



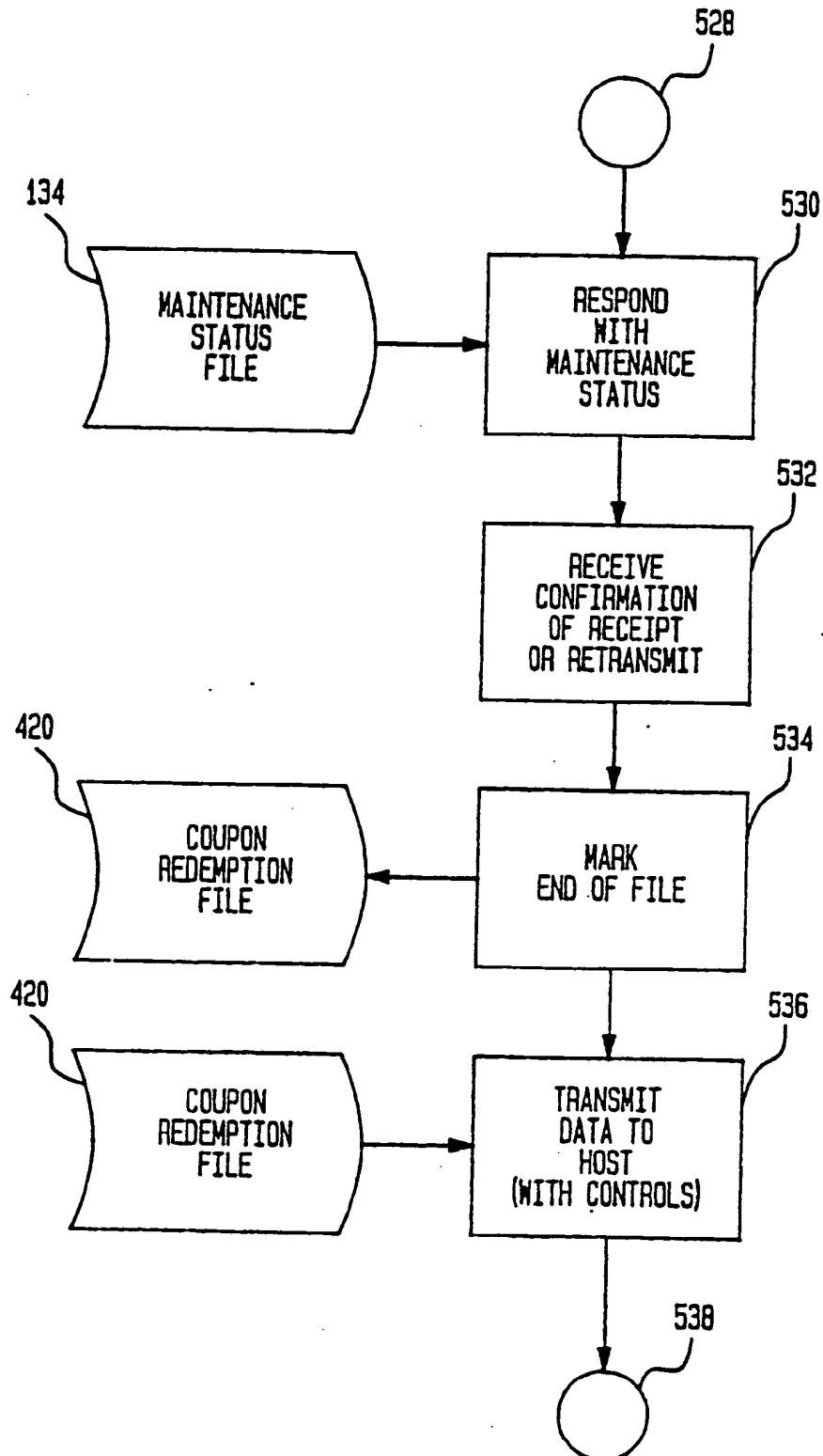


FIG. 36

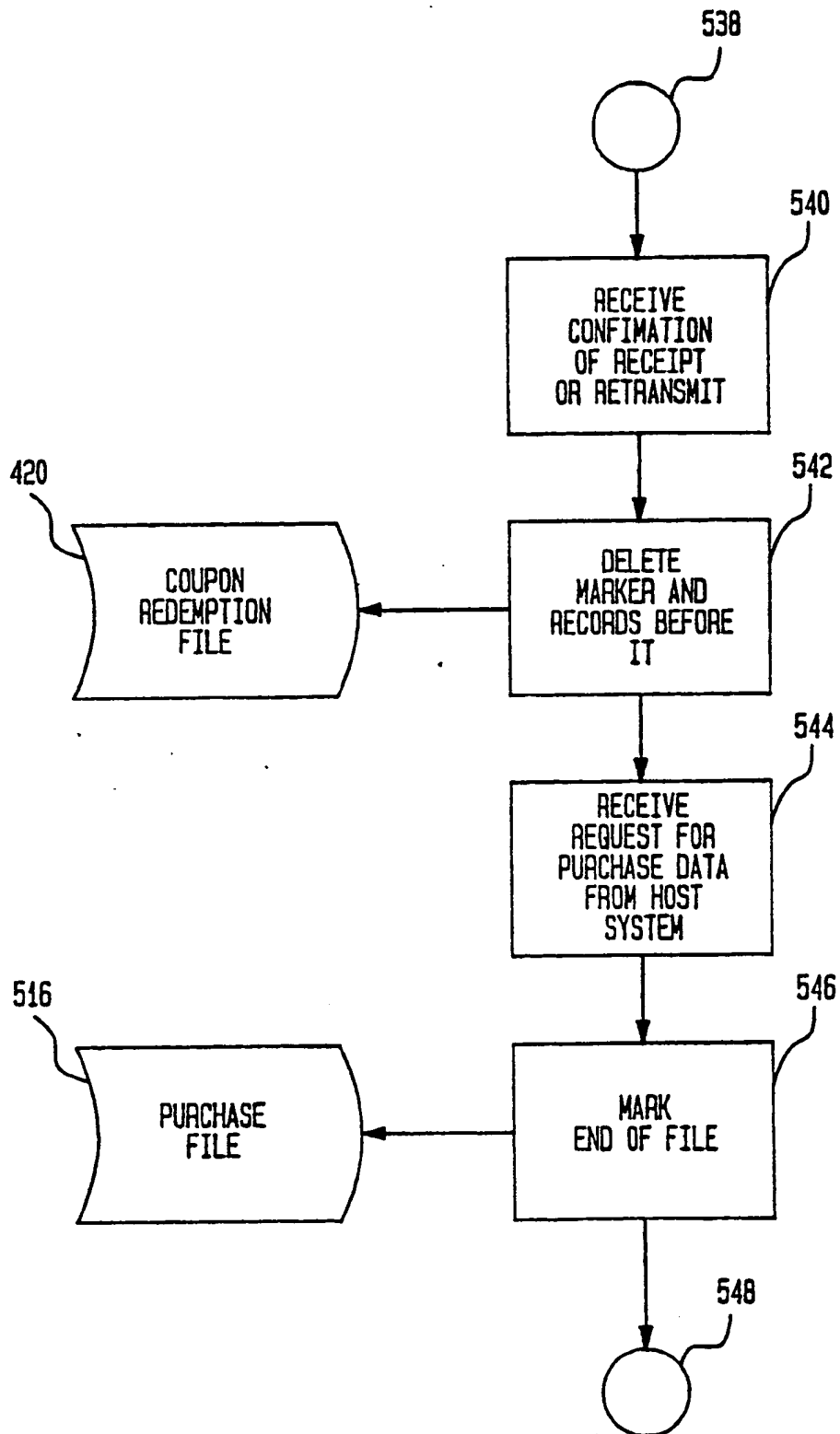


FIG. 37

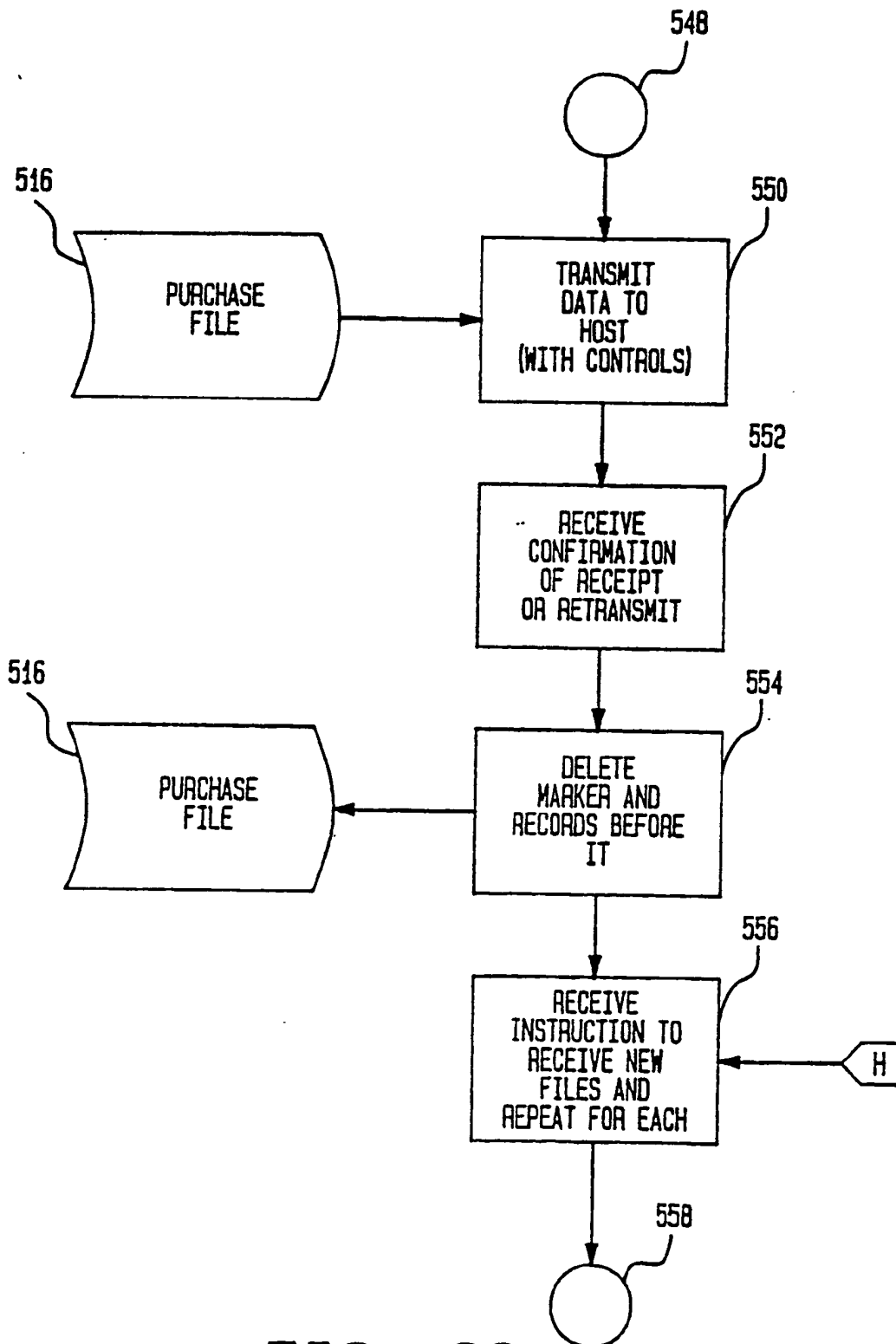


FIG. 38

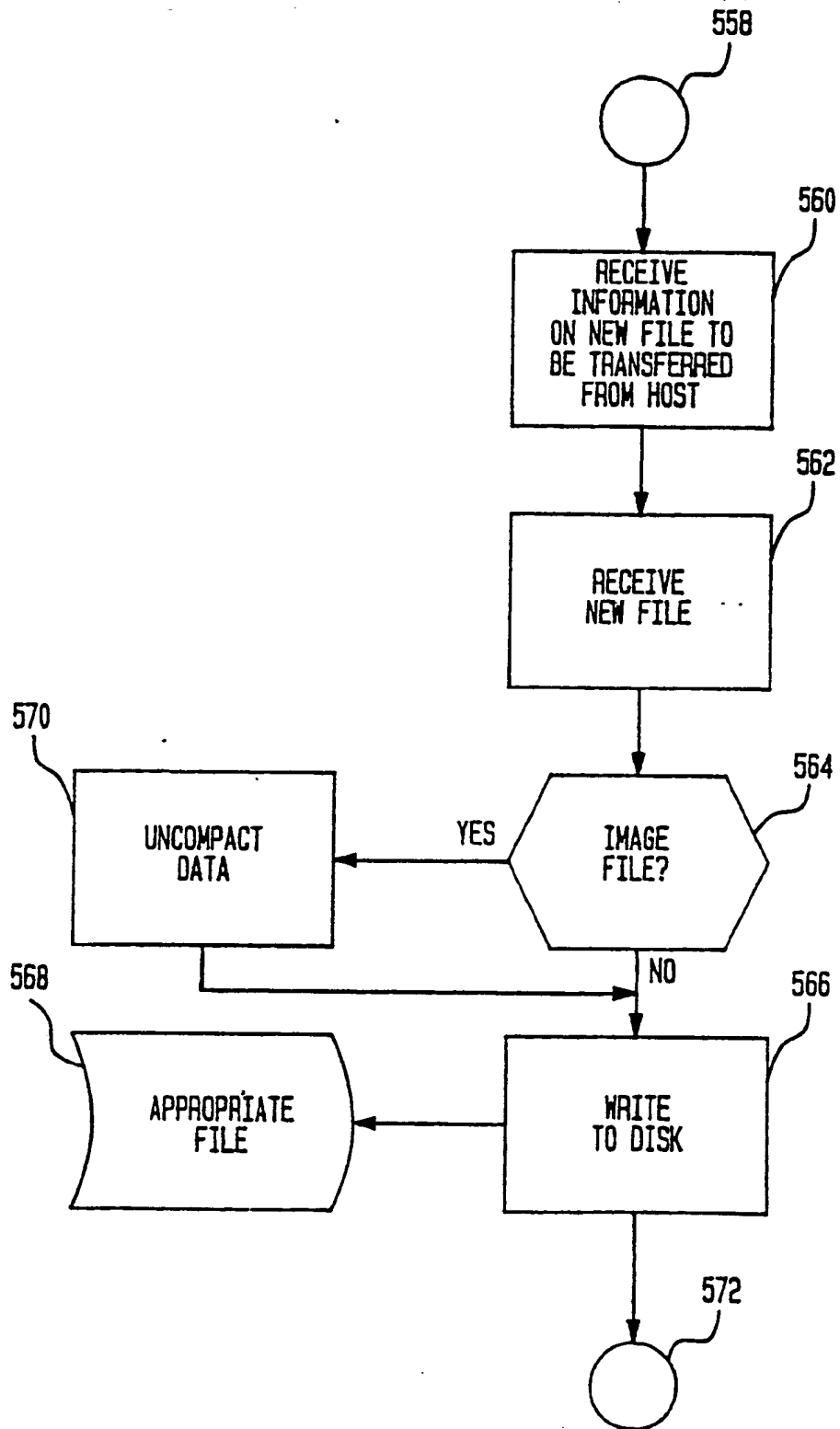


FIG. 39

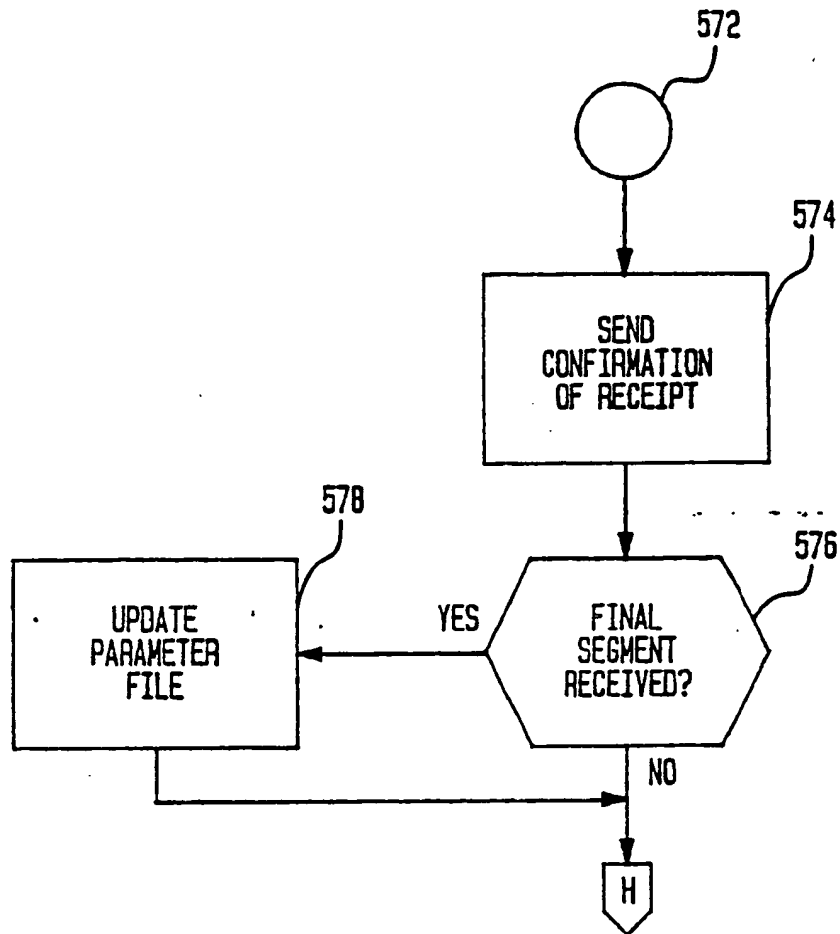


FIG. 40

# INTERNATIONAL SEARCH REPORT

International Application No PCT/US85/0215 1

## I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) <sup>3</sup>

According to International Patent Classification (IPC) or to both National Classification and IPC

INT. CL<sup>4</sup> G06F 7/04; G06F 15/21; G06K 19/00; G07F 7/00; G07F 7/08

US. CL.. 364/401,479; 235/381,382,493,494; 340/825.35

## II. FIELDS SEARCHED

### Minimum Documentation Searched <sup>4</sup>

Classification System	Classification Symbols
U.S.	364/401,478,479; 235/381,382,487,493,494 340/825.35; 194/2,4R

Documentation Searched other than Minimum Documentation  
to the Extent that such Documents are Included in the Fields Searched <sup>6</sup>

## III. DOCUMENTS CONSIDERED TO BE RELEVANT <sup>14</sup>

Category <sup>5</sup>	Citation of Document, <sup>15</sup> with indication, where appropriate, of the relevant passages <sup>17</sup>	Relevant to Claim No. <sup>18</sup>
Y,P	WO, A, 8501373 (ELECTRONIC ADVERTISING NETWORK, INC.) 28 March 1985 (28.03.85).	1-31
X,E	US, A, 4,554,446 (MURPHY ET AL) 19 November 1985 (19.11.85), see column 9, line 62 through column 12, line 7.	1-3,5,6,9,10, 13,14,27, 28 and 31.
Y		4,7,8,11,12, 15-26,29
Y	US, A, 4,124,109 (BISSELL ET AL) 07 November 1978 (07.11.78), see column 6, lines 9-30.	8,11,12,21,22, 29,30
Y	US, A, 4,449,186 (KELLY ET AL.) 15 May 1984 (15.05.84), see column 3, line 67 through column 4, line 24.	4

\* Special categories of cited documents: <sup>16</sup>

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

## IV. CERTIFICATION

Date of the Actual Completion of the International Search <sup>2</sup>

24 December 1985

Date of Mailing of this International Search Report <sup>3</sup>

10 JAN 1986

International Searching Authority <sup>1</sup>

ISA/US

Signature of Authorized Officer <sup>10</sup>

*Clark A. Jablon*  
CLARK A. JABLON

## III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)

Category *	Citation of Document, <sup>16</sup> with indication, where appropriate, of the relevant passages <sup>17</sup>	Relevant to Claim No <sup>18</sup>
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- |   |  |  |
|---|--|--|
| A | US; A, 4,186,438 (BENSON ET AL)<br>29 January 1980 (29.01.80). |  |
| A | US, A, 4,247,759 (YURIS ET AL)<br>27 January 1981 (27.01.81).  |  |
| A | US, A, 3,959,624 (KASLOW)<br>25 May 1976 (25.05.76).           |  |
| A | US, A, 4,412,631 (HAKER)<br>01 November 1983 (01.11.83).       |  |